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ABSTRACT

This book of conference proceeding presents speeches and panel discussions from the Region East Perceptual-Motor Conference. The purpose of the conference was to seek an understanding of children and their perceptual-motor development through (a) exchange of knowledge and practices in perceptual-motor development, (b) examination of program rationale and activities, (c) participation in innovative equipment activities and programs, and (d) consideration of present and future roles of the physical educator in planning the total education of the child. Discussions on the following topics are included: (a) interaction of perceptual, intellectual, and motor functions; (b) information processing and perceptual-motor development; (c) perceptual-motor development activities in preschool and primary grades; (d) perceptual-motor development programs for learning-disabled children; (e) play as a learning medium; (f) how interdisciplinary teams see children; (g) perceptual-motor development in teacher preparation programs; (h) physical education and recreation innovations in special education; (i) diagnosing perceptual-motor disabilities; (j) research findings regarding perceptual-motor development and academic performance; (k) perceptual-motor development and learning readiness skills, and (l) a conference summary (with implications for education). (PD)

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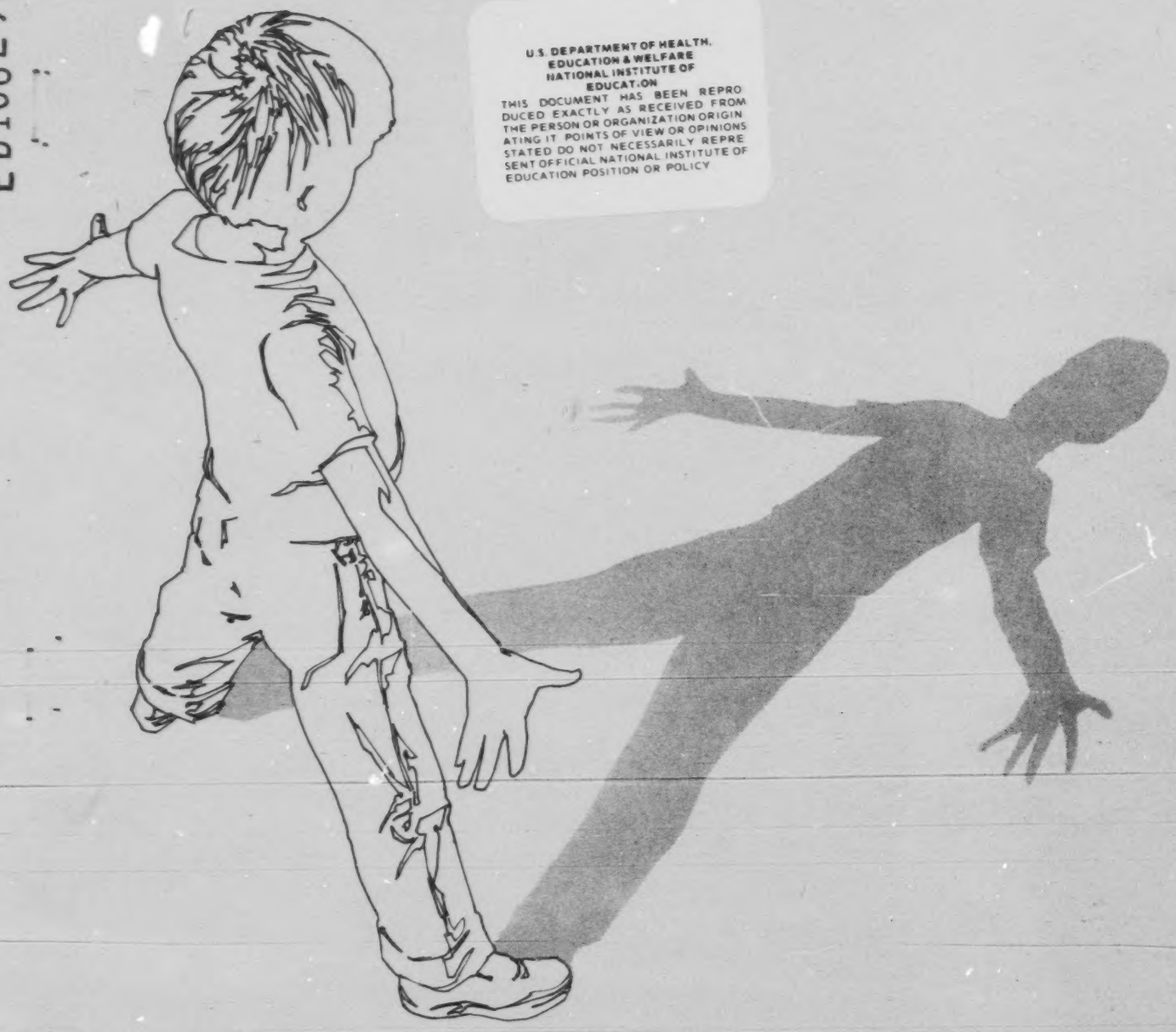

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Dr. Marguerite Clifton, Professor and Head of Department of Physical Education for Women, Purdue University, Lafayette, Indiana - Perceptual-Motor Development Activities in the Pre-School and Primary Grades.

Dr. Elmer Kane, Perceptual-Motor Specialist, Glen Ridge, New Jersey - Perceptual-Motor Development Programs for Children With Learning Disabilities.

Dr. Mary W. Moffitt, Professor of Education, Queens College, City University of New York - Play as a Medium for Learning

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Dr. Virginia Crafts, Department of Physical Education, Illinois State University, Normal, Illinois, Dr. Ruth Lindsey, Department of Health and Physical Education, Oklahoma State University, Stillwater, Oklahoma, Dr. Hubert Hoffman, Physical Education Teacher Preparation, University of South Florida, Tampa, - Perceptual-Motor Development in the Programs of Teacher Preparation.

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Mr. Lee Haslinger, Director of Physical Education and Athletics, Pontiac Public Schools, Pontiac, Michigan - Perceptual Motor Development and Learning Readiness.

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PREFACE

The Region East Perceptual-Motor Conference sponsored by the Physical Education Division of the American Association for Health, Physical Education, and Recreation was held at the Fort Harrison Hotel in Clearwater, Florida, on October 28th, 29th, 30th, 1971. The conference was attended by 323 participants representing the fields of special education, physical therapy, occupational therapy, optometry, psychology, medicine, early childhood education, art education, recreation, and physical education. Also included among the participants were elementary grade teachers and teachers of reading. There were professionals from 29 states, the District of Columbia, Canada, and Puerto Rico.

The registration forms of the conference participants who pre-registered revealed that their levels of involvement as teachers, supervisors, or administrators were college or university 38%, elementary grades 36%, secondary 3%, and other 23%. The perceived levels of knowledge of the participants in regard to perceptual-motor development were: beginning level 31%, moderate level 59%, and advanced level 10%.

The conference was planned as a multidisciplinary examination of foundations and practices in perceptual-motor development by the AAHPER Perceptual-Motor Task Force, Representatives from the Southern, Eastern, and Mid-West Districts, the Conference Director and Dr. Margie Hanson, Consultant on Elementary Education of AAHPER.

The purpose of the conference was to seek an understanding of the child and his perceptual-motor development by:

1. Facilitating the inter-disciplinary exchange of knowledge and practices in perceptual-motor development.
2. Critically examining the rationale and activities in perceptual-motor programs.
3. Participating in and exchanging ideas in regard to innovative equipment, activities, and programs of perceptual-motor development.
4. Considering the present and future role of the physical educator on the multidisciplinary team in the total education of the child.

Achievement of the purposes of the conference were sought through the presentation of a wide range of both theoretical and practical topics through a variety of presentations and participatory activities.

The Conference Director and J. McVicker Hunt agreed prior to his acceptance of an invitation to address the conference that due to professional commitments that he would not be able to provide a written transcript of his presentation. Regretfully his presentation will only be shared by the conference participants.

The presentation of the panel discussion moderated by Dr. Ray Wunderlich has been edited to provide representative highlights of both the 9 00 a.m. and 11:00 a.m. panel dialogues. The resulting article included in these proceedings thus has concisely combined the major points presented.

The conference presentations of Dr. Patricia Tanner and Mrs. Jane Young, College of Education, University of South Florida, are not included in these proceedings. The clarity of meaning and enthusiasm of the participants of the filmed and live demonstration titled "Pre-Primary Movement Experiences with Relationship to Perceptual-Motor Development" was difficult to express in words. Dr. Tanner and Mrs. Young wish to express their gratitude to the Headstart children, Mort Elementary School, Tampa, Florida, and to the classroom teacher Mrs. Esther Youngblood for their cooperative involvement in the presentation.

Dr. Viola Brody of the Child's Guidance Clinic of the Pinellas County School System made a presentation which consisted of her comments and answers to questions concerning the film of her program entitled "Attachment and Cognitive Development: A Parent-Child Play Therapy Model for Learning in Problem Children in Special Education." The editors are not including a written transcript of this presentation as it was primarily visual and would not be adequately represented by words. Information concerning this film is found in the proceedings entry- Films Shown at the Region East: Perceptual-Motor Conference.

ACKNOWLEDGEMENTS

The State Liaison Representative to the Perceptual-Motor Task Force from Florida, Dr. Louis Bowers of the University of South Florida, served as Conference Director and Dr. Stephen Klesius of the University of South Florida was the Conference Site Coordinator. Continuous assistance during the planning and conducting of the conference was provided as needed by Dr. Marguerite Clifton, Chairman of the Perceptual-Motor Task Force, Dr. Lee Haslinger, Task Force Liaison to Conference, Dr. Cecil Morgan, Southern District Representative, and Dr. Robert McAdam, Midwest District Representative.

The Conference Director and Site Coordinator wish to extend special recognition and thanks to Dr. Margie Hanson, American Association for Health, Physical Education, and Recreation - Elementary Education Consultant, as the Association's Staff Liaison to planning and conducting the conference. Her efforts toward achieving a quality conference were present from its inception to conclusion.

PROGRAM

WEDNESDAY, OCTOBER 27

7:00 p.m. - 10:00 p.m. (Pinellas Lobby)	REGISTRATION
9:00 p.m. - 10:30 p.m. (Poolside Patio)	Florida Poolside Welcome

THURSDAY, OCTOBER 28

8:00 a.m. - 5:00 p.m. (Pinellas Lobby)	REGISTRATION
(Fort Harrison East)	Commercial Exhibits
8:30 a.m.	GENERAL SESSION 1 - INTERDISCIPLINARY BASES OF PERCEPTUAL-MOTOR DEVELOPMENT
Presiding	Louis Bowers, Conference Director, College of Education, University of South Florida, Tampa
Welcome	Dr. Margie Hanson, AAHPER Elementary School Consultant
Introduction of Panel	Dr. Robert McAdams Department of Physical Education, Illinois State University Normal, Illinois
8:45 a.m. - 9:30 a.m.	
Topic	Interaction of Perceptual, Intellectual, and the Motor Functions
Speaker	Dr. Leonard Cohen, Professor of Physiology, Michigan State Univ. Director of Regional Medical Program, Farmington, Michigan
9:30 a.m. - 10:15 a.m.	
Topic	Information Processing and Perceptual-Motor Development
Speaker	Dr. Harriet Williams, Department of Physical Education, University of Toledo, Toledo, Ohio

PROGRAM (Continued)

THURSDAY, OCTOBER 28

10 15 - 10 45 a.m. (Fort Harrison East)	Coffee and Juice Break
10:45 - 12:30 p.m. (Fort Harrison West)	Round Table Discussion of Panel Presentations- Questions to Panelist, Moderator - Dr. Robert McAdams
12:30 p.m. - 1.30 p.m.	LUNCH
1:30 p.m. - 2:00 p.m. (Hibiscus Room-Colonial Room)	Film Showings - Idea Mart
2:00 p.m. - 3:00 p.m. (Fort Harrison West)	
Presiding	Mr. Lee Haslinger, Director of Physical Education and Athletics, Pontiac, Michigan
Topic	Pre-Primary Movement Experiences with Relationship to Perceptual-Motor Development - Demonstration: Headstart hildren, Mort Elementary School, Mrs. Esther Youngblood, teacher.
Speakers	Dr. Patricia Tanner and Mrs. Jane Young, College of Education, University of South Florida, Tampa
3:00 p.m. - 3:30 p.m.	Reactions to Presentation by Inter-disciplinary Panel - Questions by Participants - Moderator: Lee Haslinger
3:30 p.m. - 4:00 p.m. (Fort Harrison East)	Coffee and Coke Break
4:00 p.m. - 5:00 p.m. (Fort Harrison West)	
Topic	Perceptual-Motor Development Activities in the Pre-school and Primary Grades
Speaker	Dr. Marguerite Clifton, Professor and Head of Department of Physical Education for Women, Purdue University, Lafayette, Indiana

THURSDAY, OCTOBER 28

5:00 p.m. - 5:30 p.m.	Reactions to Presentation by Interdisciplinary Panel - Questions by Participants - Moderator: Lee Haslinger
6:00 p.m. - 7:00 p.m. (Poolside)	Poolside No Host Social Hour
9:00 p.m. - 10:00 p.m. (Hibiscus Room-Colonial Room)	Film Showings

FRIDAY, OCTOBER 29

8:30 a.m. - 10:00 a.m.	Participants elect to attend either Session A, B, or C
Session A (Fort Harrison West)	
Moderator	Dr. Cecil Morgan, Department of Physical Education, George Peabody College, Nashville, Tennessee
Topic	Perceptual-Motor Development Programs for Children with Learning Disabilities
Speaker	Dr. Elmer Kane, Director of Windward School, White Plains, New York
Reactors	Dr. Loretta Starlings, Department of Physical Education, George Washington University, Washington, D.C.
	Mr. Robert Janus, Montgomery County Schools, Capitol Heights, Maryland
Session B (Fort Harrison East)	
Moderator	Dr. Margaret Crickenberger, College of Education, University of South Florida, Tampa
Topic	Play: A Medium for Learning

FRIDAY, OCTOBER 29

Speaker	Dr. Mary Moffitt, Department of Early Childhood Education, Queens College, New York
Reactors	Miss Tommye Yates, Physical Education Consultant, Lookout Regional Shared Services, Lafayette, Georgia
	Dr. Richard Loveless, Department of Art Education, University of South Florida, Tampa
Session C (Hibiscus-Colonial Rooms)	
Moderator	Dr. James Jarrett, Department of Physical Education, Old Dominion University, Norfolk, Virginia
Topic	The Interdisciplinary Team Looks at the Child
Speaker	Dr. Ray Wunderlich, M.D., Director of Learning and Maturation Center, St. Petersburg, Florida
Panelists	Robert Melby, O.E., Developmental Optometry
	Melvyn Grossman, M.D., Child Psychiatry
	Rosemary Ammons, M.A. Intellectual Evaluations
	Virginia Gates, M.A. Reading and Education
	Mazie Cawthorne, R.P.T., Physical Therapy Perception
10:00 - 10:30 Noon (Pinellas Lobby)	Coffee and Coke Break
10:30 a.m. - 12:00 Noon	Participants will elect to attend either Session A, B, or C. Moderators and Reactors for the 10:30-12:00 sessions will be:

FRIDAY, OCTOBER 29

Session A
(Fort Harrison West)

Moderator	Jane Hanneken, St. Louis Hills Perceptual-Motor Learning Center, St. Louis, Missouri
Topic	Perceptual-Motor Development Programs for Children with Learning Disabilities - Dr. Elmer Kane
Reactors	Billy Gober, College of Education, University of Georgia, Athens
	Dr. Paul Hahn, Department of Physical Education, Prince George's Community College, Maryland

Session B
(Fort Harrison East)

Moderator	Dr. Helen Connor, Department of Physical Education, University of Alabama, Tuscaloosa, Alabama
Topic	Play as a Medium for Learning - Dr. Mary Moffitt
Reactors	Dr. Jacqueline Herkowitz, Department of Physical Education, Florida State University, Tallahassee, Florida
	Dr. Hal Lerch, Department of Physical Education, University of Florida, Gainesville

Session C
(Hibiscus - Colorial Rooms)

Moderator	Dr. Donald Cleland, Department of Reading, University of Pittsburgh
Topic	The Interdisciplinary Team Looks at the Child - Dr. Ray Wunderlich and Panelists

FRIDAY, OCTOBER 29

1:00 p.m. - 3:00 p.m.	Continuous film showings - Idea Mart presentations - Homemade Equipment Displays - Participation in Perceptual-Motor Development Activities - Interest groups - Pool-side happenings
3:00 p.m. - 8:00 p.m.	FREE TIME - Beach-Pool-Dining
8:00 p.m. - 9:00 p.m.	GENERAL SESSION
Presiding	Dr. Louis Bowers Conference Director
Introduction	Dr. Peter Everett, President of FAHPER, Chairman, Department of Physical Education, Florida State University, Tallahassee
Topic	Informational Interaction and Early Development
Speaker	Dr. J. McVicker Hunt, Professor of Psychology and Education, University of Illinois, Champaign, Illinois

SATURDAY, OCTOBER 30

9:00 a.m. - 10:20 a.m.	Sessions A,B,C,D,E, will be repeated from 10:40 a.m. to 12 noon in the same rooms
10:20 a.m. - 10:40 a.m. (Pinellas Lobby)	Coffee Break
10:40 a.m. - 12:00 noon	Participants will be able to attend the two sessions for which they have signed up. Session F will be continuous from 9:00 a.m. 10:20 a.m. and from 10:40 a.m. to 12:00 noon
Session A (Hibiscus Room)	
Introduction	Dr. Margaret Elliot - 9:00 a.m. Dr. Frances Myers - 10:40 a.m.

SATURDAY, OCTOBER 30

Topic	Perceptual-Motor Development in the Programs of Teacher Preparation
Speakers	Dr. Virginia Crafts, Department of Physical Education, Illinois State University, Normal, Illinois
	Dr. Ruth Lindsey, Department of Health and Physical Education, Oklahoma State University, Stillwater, Oklahoma
	Dr. Hubert Hoffman, Physical Education Teacher Preparation, University of South Florida, Tampa

Session B
(Fort Harrison West)
Area 1

Introduction	Dr. David Gallahue - 9:00 a.m.
	Dr. John Lord - 10:40 a.m.
Topic	Research and Training Grants - Bureau of Education for the Handicapped
Speaker	Mr. Warren Aaronson, Research Specialist, Bureau of Education for the Handicapped, U.S. Office of Education, Washington, D.C.

Session C
(Fort Harrison West)
Area 2

Introduction	Dr. Corale Emmons - 9:00 a.m.
	Dr. Patricia Bruce - 10:40 a.m.
Topic	Diagnosis of Perceptual-Motor Disabilities
Speaker	Dr. Jeralyn Plack, Women's Department of Physical Education, Michigan State University, Michigan

SATURDAY, OCTOBER 30

Session D (Fort Harrison East)	
Introduction	Dr. John Anderson - 9:00 a.m. Dr. Barbara Philbrick - 10:40 a.m.
Topic	Research Findings Regarding Perceptual-Motor Development and Academic Performance
Speaker	Dr. Stephen Klesius, Department of Physical Education Teacher Preparation, University of South Florida, Tampa
Reactor (9:00 a.m. session)	Dr. Robert McAdams, Department of Physical Education, Illinois State University, Normal, Illinois
Reactor (10:40 a.m. session)	Dr. Walter Cooper, Department of Educational Research, University of Southern Mississippi, Hattiesburg, Mississippi
Session E (Colonial Room)	
Introduction	Miss Ruth Gorwill - 9:00 a.m. and 10:40 a.m.
Topic	Perceptual-Motor Development and Learning Readiness
Speaker	Mr. Lee Haslinger, Director of Physical Education and Athletics - Pontiac Public Schools, Pontiac, Michigan
Session F (Cloud Room)	ONE CONTINUOUS PRESENTATION ONLY - 9:00 - 11:30 a.m.
Introduction	Dr. W. V. Plue, Department of Special Education, University of Southern Mississippi, Hattiesburg
Topic	Demonstration Film - "Attachment and Cognitive Development" A Parent-Child Play Therapy Model for Learning in Problem Children in Special Education

SATURDAY, OCTOBER 30

Speaker	Dr. Viola Brody, Chief Psychologist Child Guidance Center, Pinellas County Schools, Clearwater, Florida
12:00 Noon - 1:00 p.m. (Fort Harrison West)	FINAL GENERAL SESSION
Introduction	Dr. Margie Hanson, Elementary Physical Education, AAHPER, Washington, D.C.
Topic	Conference Summary and Implications for Education
Speaker	Dr. Katurah Whitehurst, Department of Psychology, Virginia State College, Petersburg, Virginia
1:00	ADJOURNMENT OF CONFERENCE

INTERACTION OF PERCEPTUAL, INTELLECTUAL, AND THE MOTOR FUNCTION

by
Dr. Leonard Cohen
Professor of Physiology
Michigan State University
Farmington, Michigan

We are always trying to analyze what is the role of physical education. The neuro-physiologist worries about the role of motor activity, in the general scheme of things. It has been traditional in all disciplines of endeavor whether it's the basic life sciences, elementary education, or higher education to make separations between motor activity and intellectual function and motor and sensory function. One of the key discussions in the Cincinnati Conference which Dr. Clifton reviewed so well, was whether there is justification in separating motor and perceptual functions. I was one of those who felt that while it was traditional to do so and it had some advantages in order to understand what is involved, the body and the brain, particularly the brain, does not consider the two elements as separate and always merges them. My principle theme is that it is now abundantly clear that motor and perceptual mechanisms can not be separated but also no separation can be made between motor functions and intellectual functions. In addition, it may well be possible to stimulate and to enhance intellectual development by proper perceptual-motor training. This is entirely feasible since the two are inter-connected in the brain, as a neurological connection or a neuro-physiological connection. In order to develop this quickly the neurological organization of the brain and spinal cord will be stated first. In order for perception to occur we have to have some kind of peripheral sensory receptor to pick up a particular sensation. We need tactile or pain receptors in the skin, muscle spindle receptors in the muscles to give us an appreciation of movement and position, and middle ear receptors for balance. In other words we cannot perceive what is happening in the environment unless we have specialized sensors, to use the term of the engineers, or receptor, to use the term of physiologist, to pick up the physical forces in our environment and to communicate them to the brain. The direct pathway from these sensors or receptors is to the brain, where eventually it reaches the sensory cortex, where a conscious awareness takes place, which we

call perception of the sensation. In addition to this pathway there is also a branch that comes from the very same single pain neuron that's coming into the spinal cord from the skin. This neural action stays at a local level, usually there is one intermediate neuron in this particular pathway. Then there is a synapse with a ventral horn cell in the ventral horn of the grey matter, which goes then back to the muscle in the general region of the body where the original receptor in the skin is located. Usually there is a flexor muscle to which the motor neuron goes. Under conditions of pain we get activation of that muscle and flexion of the limb and withdrawal from the painful object occurs. This is called the flexor reflex. The key thing to point out is that we do not always realize this, and it is rarely presented in text books. In fact, in neuro-anatomy and neuro-physiology books, this type of simple action is generally not diagrammed. The reflex phase is included under reflexes along with the stretch, cross extensor and other reflexes whereas the perceptual phase is usually considered later as part of brain function and rarely are the two connected in the way they should. Each single pain fiber or the vast majority of them that come into the spinal cord branch out. One branch goes up to the brain and creates a conscious perception. The other branch connects with a motor neuron and if it fires enough will activate a motor cell neuron. So it is impossible for nerve impulses to come up a single pain neuron without also traveling in both directions down each one of the branches. So we cannot get anything such as a pure reflex type action without also creating activity in the perceptual areas of the cortex of the brain. There may be a greater lag, a larger pathway, before we are consciously aware of the pain, but it's only a split second difference. I can do typically the same thing for another path, by starting with the typical muscle spindle. Here again there is a branching of the incoming neuron, in one branch, the reflex makes a direct connection with the vertical horn cell, mono-synaptic reflex. That neuron also goes to the same general area of the muscle from which the innovating muscle spindle arises. So this is the stretch reflex, a portion of which is the common knee jerk. The stretch of the muscle will activate the muscle which you tap and this muscle is usually an extensor muscle. But there is also a branch in this neuron which goes up to the cord, usually goes in the dorsal veniculi and travels all the way up to the head of the spinal cord where it synapses and

connects with other neurons going to the brain. So again it is not possible to get activation of a muscle spindle without doing two things: 1) bombarding neural impulses in the ventral horn cell with which that receptor makes connections and 2) bombarding the higher sensory area of the cord which in turn will cause some activity in the conscious perceptual areas of the brain. So we see from the very beginning that so far at least we cannot get any kind of perception without automatically making connections with central horn cells which are motor neurons. These are the final nerves that cause muscles to contract. We cannot get perception in isolation of activity of those nerves which are controlling muscle activity. It is an anatomical and physiological impossibility. This particular fact has been neglected too long and should be emphasized here because of its importance for what is being considered at this conference. How about voluntary motor activity? Voluntary motor activity is a result of activation of the motor cortex in generating impulses which are sent through these same cerebral horn cells. For any kind of voluntary motor activity you still have to use these same cerebral horn cells. Of course the level of activity of these horn cells is determined by the sensory receptor and is going to determine to a large degree what happens with the activity coming from your brain. So we have to associate the motor ability with these horn cells. There is a connection and the only way in which you can influence motor activity, whether voluntary or reflex, is through some common pathway going to the muscle which we call the central horn cell or the lower motor neuron. Can we tie in intellectual activity, which would be a fairly unique contribution? The answer is yes. We can divide brain function into primary sensory receiving areas. The back part of the brain primarily is concerned with vision; lateral portion being the primary receiver for hearing; and the sensory cortex for skin, body, and sensation awareness. It is felt that general intellectual functioning is not localized only to the frontal lobe but rather seems to be a function of the association areas of the brain, whereever those areas occur. Now, next to almost every primary receiving area it has been proven that there is an association area for that particular function. So that anterior to the back part of the brain where the receptors from the eye, cause firing of primary receiving areas of vision, will be

located in the area where you get complex visual images. Stimulation of that part of the brain evokes complex visual images, if you stimulate the primary receiving area you'll get a spot of light. But, if you stimulate the association area then a landscape or the seashore or something like that may be seen. Next to the primary receiving area where the simple inputs are assembled into some kind of visual information. There is an association area which tends to combine all the visual sensations (images) and sometimes to relate it to other primary sensory areas. Thus we would have a visual-auditory association tract which would be made up of neurons connecting the primary visual with the primary auditory area. This may be done through these respective association areas, but anyway this is the basic connection. So the more complex things in life that we are aware of, reason about, and analyze in our minds, things that we can see and analytically dissect are built by associating the primary perceptual information coming into the brain. It is possible then if a person unfortunately were born, as was reported in the 1800's, with no sensation at all in one eye,and the sensory input to this eye was stopped the person automatically went to sleep. The idea being without some kind of perceptual contact with our environment the brain becomes inactive. There is certainly now much better appreciation of the fact that thought, cognition and these higher functions, does not occur spontaneously. There has to be some kind of environment stimulus, something happening in our immediate environment, in our interaction with people, that reminds us of something that happened or the causes of perception that cause us to think. There has to be some perceptual awareness or sensory stimulation before cognition or thought, intellectual function can take place. Therefore a very close tie exists between intellectual and perceptual functions and in modern concepts they really cannot be separated. It is indeed as wrong to separate them, as it is to separate motor and perception. Similarly, not only do we need perceptual input in order for intellectual function to occur but, for instance, when a decision is made as a result of intellectual function a motor act is involved. Oftentimes even before a decision is made, while we are thinking, especially about something in our environment we may make a motor act. We do something about the thing that is bothering us and then see what the result is. It may

be exploring an object by lifting it, feeling its weight, squeezing it to see if it's soft or hard. Motor activity of this nature is a direct tool for obtaining information. The concept I would like to emphasize is that while it is essential to consider the separate or distinctive nature of motor intellectual and perceptual function of the human being, none the less, in actual practice there's only one brain for each organism and the brain absolutely unifies these 3 functions. It's really impossible to conceive of a situation in which you can only have pure intellectual, motor, or perceptual activity., without the involvement of the others. So there is really a unified concept. The elements are different, and it may help to study and understand them by considering them as separate, but in actual function they are inseparable, and cannot be separated.

I'd like to briefly consider some of the modern trends and techniques in analyzing perceptual-motor interaction. It's been traditional in the development of children for many years to use motor activity as a measure of intellectual development. It was traditional mainly not so much because of the type of awareness which was stressed in the first portion of this paper but more because of the practicalities of the situation. When you deal with the young infant it is almost impossible to test that child and find out what he is thinking about or to determine what thought processes are going on. You cannot give them an intelligence test because they don't talk, they are too young. However, they move, so motor activity is studied as a measure of human development from the neonatal stage up until the age of talking. How can we tell what kind of development goes on in the nervous system, especially in intellectual function except by studying motor function and often-times perceptual-motor functions. There are always those who question the validity of using motor tasks in measures of intellectual development, even if you concede that there is a close relationship between these functions. You are demanding more when you want to measure, quantitatively the intelligence of a newborn infant by doing certain motor tasks and seeing what his movements are and measuring those. So it is one thing to have a qualitative connection and it's another to say it is a rigorous proportional quantitative connection. This is what was attempted through the years. It has been questioned a lot especially in recent years

and while I think the original naivete in this type of testing is not longer justified. Griffith, to give a traditional example of measuring of mental development, listed five different types of measurements with many different items listed under each of these categories. Girffith's "Mental Development Scale," included: 1) locomotor, 2) personal-social, 3) hearing and speech, 4) eye-hand coordination, and 5) performance categories. Some of the later workers in this field said that Griffth's five categories were really only three categories. Motor acts such as raising the head and pushing with the feet are traditionally used as indications of mental development. Attempts were made, by doing detailed descriptions of each one of these items, to make the instrument more scientific. But first of all, when some of these functions are considered in detail, that doubt will arise whether these motor acts actually measure mental function. For example one item which calls for the child to roll from side to back, which is considered a normal development for 3rd month, is placed in the Griffith scale under the locomotor items. The instructions are to place the baby on his side with his face turned away from his mother, the examiner's hand must be in position of support to prevent the child from rolling too far, then the mother encourages the child to roll over on to his back toward the sound. The child must achieve this himself and thus to pass this test there is perceptual awareness and a certain amount of intelligence involved. If the child is to distinguish his mother's voice from other voices, and it will show in the child's behavior by a greater response to mother's voice than to others. Of course turning the head is a motor act and if we really direct the so-called locomotor test we find motor, intellectual, and perceptual aspects involved.

Now there are a number of other ways to measure intellectual function. Modern techniques that evoke cortical potential when you stimulate with sound, vision, and touch an infant and with a small computer connected to the electroencephalograph can pick up distinctive patterns of firing in the brain, if conscious perception is taking place in the brain, if the sensory sensation is reaching the brain. Here you have an objective physical measure of sensory input and of perceptual activities. There are a series of tests that concentrate on the attention span of the infant, saying that's more important than motor activity. To measure this a standard object and variation of that object are continuously presented and measurement

is taken of how long the child observes it. There are also measures of heart function. It has been found that in the attention span for new objects the heart rate speeds up and after the object becomes familiar you do not get the same cardiac acceleration. It has been shown in certain auditory tones that you can get cardiac acceleration in response to sounds in an infant. Also accurate measures in adults and infants of mental intellectual functions by measuring during sleep by what is called Rapid Eye Movement (REM). REM indicates thought processes going on in sleep, as indicated by certain types of dreams. By putting electrodes near the eye one can measure eye movements even under the lids and the amount of movement is conceded as the amount of thought in the brain. This is also applicable to infants in early stages of life.

In closing it can be stated that at our deepest level of knowledge we can not have thought without having perception and without having motor activity exploration to get more information coming back to the brain for further thought. It should be possible to develop physical exercises which require sensory discrimination and perceptual input to give to the brain the kind of activity as outlined in the modern concept of thought. Recalling previous sensory experiences, comparing them with present sensory experiences and making some motor response to it. It is possible to have a perceptual input, which directly involves intellectual processes of the brain, the motor response, and as the result of the motor response, further perceptual input and further thought resulting in further motor responses. It is within the grasp of the physical educator, to apply such methods and in effect with proper types of physical exercise with these perceptual input and motor input to use these exercises not just as a release of energy for a child who has to sit around a lot or not just to develop his motor systems separately, or parallel with his mental system which the other teachers are taking care of but as a tool to directly develop the whole brain including the intellectual function. This is the whole area I feel for the physical educator should not be conceded to others. With devising of proper tests it is possible by these motor activities to develop intellectual function and to make that activity during education the motor activity just as productive of intellectual development as is the more traditional types of classroom learning.

PERCEPTUAL-MOTOR DEVELOPMENT IN CHILDREN
INFORMATION AND PROCESSING CAPACITIES OF THE YOUNG CHILD

by

Dr. Harriet Williams
Department of Physical Education
University of Toledo
Toledo, Ohio

Over a century ago Seconoff, a Russian physiologist, suggested that all of human behavior could be thought of as a product of three very close interrelated processes: 1) sensory or afferent input, 2) a cortical or cerebral process, and 3) efferent or motor output. He further hypothesized that of these three the motor followed after and was based on the outcome or effectiveness of the first two processes. If for the sake of simplicity and clarity we were to lump the first two processes together and call them perception and label the latter as movement or motor behavior, we find that what Seconoff was suggesting over one hundred years ago was that all of man's behavior could be thought of essentially as a series of perceptual events followed by a series of motor or behavioral acts. This particular formulation points out very closely, that the processing of specific sensory perceptual information is both prerequisite to and necessary for adequate execution of adaptive motor reactions. This would indicate that, if the processing of afferent information, upon which a motor behavior is based, is both rapid and precise then the probability of that behavior being skillful or adaptive is much greater than if the processing of such afferent information is inadequate or ineffective. In other words, most of our motor acts are really a product of the precision of the afferent processes which precede them. There is indeed much evidence today to support the notion that sensory perceptual processes are indeed irrevocably linked to the production of adaptive overt behavior; that indeed afferent input are an intricate part of the chain of events leading to effective adaptation to the environment. It is because there is this very strong and identifiable link between overt behavior and sensory perception, or afferent processes that the term perceptual-motor has been coined and used so widely. The use of the term is an attempt to continually draw attention to the fact that sensory perception processes are vital in all of human behavior. Thus, it's strange that we have just begun to recognize that one of the things that most characterizes the perceptual-motor development of the young child is a steady and continuous change in the

afferent functions of the central nervous system. Changes which are necessary are prerequisite if the child is to develop greater control and/or direction of his overt motor behavior. From an information processing point of view, these changes in the central nervous system are reflected primarily in the improved capacity of the child to handles increasingly large quantities of more and more complex environmental input. Thus, as perceptual-motor development proceeds the child develops increased capacity for handling more complex quantities of sensory input and the thing that we observe behaviorally in the child is an improved capacity on the part of the child to execute more skillful, complex, and adaptive motor behaviors. The whole concept of P.M.D. is one that deals with changes in the afferent processes of the young child. Changes are reflected in more effective, adaptive, and modifiable motor behavior in the young child. These changes in afferent processes are revealed in three major changes that occur during the perceptual-motor development of the child.

Afferent reorganization is seen first in the shift from the dominance or preeminence of the use of input from the touch or movement receptors to the predominant use of input from the distance receptors, mainly the eyes for the control of motor behavior. In other words, perceptual-motor development in the normal child is characterized by a shift in reliance from tactile-kinesthetic cues to a primary reliance on visual cues for the control his behavior. This shift to dominance by the visual system represents the shift from input from sensory systems with relatively elementary or crude information processing capacities to the use of input from sensory systems with more highly refined information processing capacities. The visual system is believed to be the most advanced of all the sensory systems with regard to the speed and precision with which it can supply information to the organism from his environment. This trend toward a dominate control of motor behavior by visual cues means of course that more refined control or modification of overt motor behavior is possible because the child using visual cues is able to make more rapid and precise assessments of the environment to which he must adapt.

Secondly, this change in afferent reorganization, seems to take the form of improved inter-sensory functioning or increased inter-sensory communication. This means that as the child grows and develops there is a greater means of communication gathered from the

sensory systems of the body. Behaviorally, the child is able to use more and more, a variety of sources of sensory input to aid him in the control of his motor behavior. As he grows and develops he can use sights, sounds, etc. in helping him modify his behavior to the environment. One of the most important characteristics of perceptual motor development is this trend toward multi-sensory, rather than unimodal, functioning on the part of the child. Important, because this trend toward motor sensory functioning is believed to be a reflection of high order brain processes; processes that allow the child to compare, match, and evaluate sensory input from different sensory systems before motor behavior is decided on. The premise that this process of multi-sensory functioning is not present or fixed at birth is supported by many descriptions of early sensory-motor stages of the child's development. These periods of development are universally described as stages of little inter-sensory communication. There is some, but it's not highly refined. Rather there are periods during which the individual sensory systems appear to function independently of one another. The pattern of perceptual-motor development of the normal child involves a definite and important trend away from reliance on input from single separate sensory modalities and toward the use of multi-sensory input in modifying motor behavior.

Thirdly, with the elaboration of these inter-modal relationships there is,at the same time, an increased differentiation power within each of the individual sensory systems themselves. This improved intra-sensory differentiation is reflected in the increasing capacity of the child to make more refined discrimination about his environment. Improved intra-sensory discrimination may be reflected in the ability of the child to make increasingly clear cut and precise visual perceptual judgements about objects or events which go to make up his surroundings - visual environment. As a result of improved intra-sensory discrimination,the child is able to see more detail in visual stimuli presented to him. He is able to see more complex interrelationships and spatial arrangements in various stimulus elements that make up the environment. As a consequence, we find that the child is increasingly able to exert a greater afferent control over his behavior and thus be more effective in adapting to environmental conditions that face him.

Answers to some questions in this area:

It seems to me that a lot of what I've said suggests, for example, that the child that may be labeled as a child with learning difficulties or a child who is perceptually deficient is one who is likely to exhibit patterns of sensory-perceptual organization that are different from those of the child developing 'normally.' The slowly developing child is likely to have less developed intra-sensory discrimination capacities and thus likely to exhibit lower levels of competency when performing visual, auditory, tactile, etc., i.e., perception skills. A comparison of intra-sensory discrimination capacities of slowly developing and normal developing children would support this kind of assumption. I compared perceptual characteristics of slowly developing children with those visual characteristics of normal children and found that these differences were statistically different. The normal child shows greater advancement in all individual perceptual skills than the slower developing child. Thus, if we are willing to accept scores on this test as an observable indication of the level of intra-sensory discrimination of the child, then we must recognize that the normal developing child has advanced to a higher level of intra-sensory discrimination than the slower child. This is revealed in his superior visual-perceptual capacity for competencies. What about behavioral indicators of inter-sensory functioning? The behavior we refer to as body awareness, body perception skills may in fact be exemplary of inter-sensory functioning behavior, i.e., right-left discrimination. In order for the child to respond correctly to request of 'show me your right arm' the child must be able to process through the auditory system, but also compare information with information stored in, or available to him through the tactile-kinesthetic sensory systems. This comparing of information is a necessary pre-requisite if the child is to identify his right arm. Right-left confusion would arise when there is some inability to compare or interrelate these two sources of sensory information. Differences in the degree of development of inter-sensory communication capacities would show up then in differences in right-left discriminations. Predictably then we would expect the slow-developer to evidence more difficulty in performing such tasks than the normal child. I found that normal developers tend to be more advanced than slower with respect to body perception or body awareness skills. Based on three different measures of body awareness it

was observed that the normal child possesses a keener sense of awareness of body and dimension and relative positions in space. These differences are reflections of differences in levels of development of inter-sensory communication in the two kinds of children. The degree of inter-sensory development is also seen in motor performance skills - Example: behavior involved in a 20 yard dash and the run and under. In the 20 yard dash he is asked in a well defined way to run from one point to another. In the run and under the child is started at a specified point in space. He runs to a second point in space, this time an obstacle, goes under the obstacle without touching it, continues to a line 5 feet beyond, touches the line and returns to start by reversing action and goes under to the starting line. If we analyze these two tasks and separate differences in them, we find that in both of them the child is asked to cover the same amount of space. However, the difference is the visually spatial framework in which these distances are covered. In the 20 yard dash the visual requirements are minimal. Thus the child can concentrate on attaining his maximum speed. This requires little refined inter-sensory communication in the sense it is not necessary for the child to continuously translate visual cues into precise motor behavior or judge, compare, and evaluate the incoming visual input against the semi-modal sensory feedback which is continually being derived from the ongoing behavior. In the run and under, however, in addition to the speed requirements, the visual-spatial demands of the task are more demanding and require that the individual pay continual attention to his visual-spatial environment and thus direct his body according to the input from that visual environment. To perform this successfully the child must maneuver his body to what he sees. He, therefore, must compare visual-spatial input with the semi-modal sensory feedback that is continually produced as the child moves through space. This places greater stress on the inter-sensory communication mechanism of the child and tends to make the task more difficult to perform. With the slower child's lack of development in inter-sensory functioning we would expect more difficulty in the run and under task than the normal child. On the 20 yard run the slower child will exhibit similar patterns of inter-sensory functioning to the normal child. When compared on these bases the normal child showed superior performances in run and under but not on the 20 yard run.

Thus an important part of the perceptual-motor development of the child is an increased inter-sensory functioning. In her Analysis of Perceptual-Motor Development in Children, Jean Ayres finds that the developmental patterns of normal children are different from those of the slower child. The data from her studies suggest that these differences in developmental patterns are a function of afferent or sensory-perceptual development of the children. One of the characteristics of normal perceptual-motor development was one of multi-sensory awareness; a general pattern that prevailed in all of the perceptual-motor development of normal children. This pattern is best described as a general sensitivity on the part of the child to spatial relations. The spatial awareness pattern importantly was multi-modal in nature rather than being confined to any one sensory modality. Thus, from the Ayres data we see that the development of the general spatial awareness is an important characteristic of the perceptual-motor development of the normal child.

In the case of the slowly developing child the only developmental patterns related to spatial awareness was one that was predominately visual in nature, and so is almost completely confined to visual-perceptual elements of the spatial relation concept. This difference between the normal and slower child suggests that the slower child is dependent on visual input from the environment for his spatial awareness and for spatial orientation while the normal child is able to use sensory input from a variety of sources to orient himself spatially. The slower child is tied to his visual world while the normal child is not. Maybe due to the ability of the normal child to use a variety of sources in his environment that he is more at home in his space world than the slower child and tends to show less confusion in spatial concepts in his space world. This suggests that one of the important differences is that the slower child's world is predominately a uni-modal space world based largely on vision while the normal child enjoys the multi-modal space world. The most outstanding developmental pattern of the slow child is best described as a general motor coordination and motor planning pattern. This pattern is characterized by the inability of the child to plan and carry out in a skillful way simple motor acts. The impact on such a general motor coordination factor is seen when no such developmental pattern appeared in the characteristic of normal children.

The patterns that characterize this generalized motor coordination for the slower child appeared only as single and unimportant factors in the total scheme of perceptual-motor development patterns for the normal child. Thus what is still undifferentiated motor coordination for the slower child has for the normal child developed into a series of well defined and smooth motor behavior responses. The basis for the existence of differences in such developmental patterns is largely a reflection of the degree to which the motor responses of the child have come under the control of more higher refined and interrelated afferent sensory perceptual processes. The presence of a general motor coordination developmental pattern for the slower child suggests that this child, unlike the normal child, is lagging behind in some aspects of his afferent or sensory perceptual development. Many of the other differences in other development patterns characteristic of these two groups of children suggested the same kind of things inherent or developmental differences in the sensory-perceptual capacities of the child. What this implies is that perceptual motor development in children is characterized by changes in the processes involved in developing increasingly refined afferent or sensory-perceptual control of overt motor behavior. This suggests the difference of normal and slower children develops in terms of their perceptual-motor characteristics is largely a reflection of differences in the degree to which this refined afferent has been developed in the individual child. The challenge forces us to clearly outline in scientific fashion the basis of the elements involved in intra-sensory discrimination and inter-sensory communication not just behaviorally but physiologically. When we have done this I'm sure that we will have met, faced, and solved most of the issues involved in perceptual-motor development in children.

A PRESCHOOL MOVEMENT PROGRAM IN PERCEPTUAL MOTOR BEHAVIOR

by
Marguerite Clifton
Purdue University

A university professor might cite many reasons for embarking on the design and conduct of a movement program for pre-school age children. These could run the gamut from "research funds are most available in early childhood education" to "pre-school children are the latest fad in education."

My reasons are rather simple. First, most people have been turned into the learning deficiency channel. Therefore, one raises the question - can we enhance the movement effectiveness of the child who is presumably without major learning problems? Second, we know that movement effectiveness requires, among other operations, the processing of information from single or multiple sensory modalities. The early childhood years constitute a critical period in the development of the sensory modes. Therefore, to what extent can appropriate movement experiences enhance sensory modality development, and conversely, will guided attention to sensory input enhance normal motor development? And, third, will a child's success in mastering various movement tasks increase his joy in movement and lead him to seek more challenging and difficult tasks as he grows older?

These questions provided the impetus for me to initiate a program three years ago. The concept of developmental levels of performance in perceptual processing and motor behavior, as exhibited by each child, has and continues to be the predominant focus of this unique movement program. With little precedence, except the classical studies of McGraw, et al, it was relatively easy to disregard chronological age as a major factor in designing program experiences as well as considering performance expectancies of the children. Performance expectancies in relatively discrete terms for the 2-5

year old is still unknown in our field. Yes, we do have some limited bio-mechanical information available that at least provides a few guidelines concerning the child's use of basic movement patterns which emerge during the pre-school years. It is time, however, to concern ourselves with the process of learning in movement situations during these early years. And this is what we consider to be our real focus in the D.M.E. Program.

With so little time available to cover so much, various methods are being employed today in an effort to communicate the underlying assumptions of this program, the hypotheses to be investigated, the program purposes which guide planning, the program schema, the task concept, and the organizational essentials. Please clear your visual and auditory channels for potential overloading in the next forty-five minutes!

AIM, PURPOSES, OBJECTIVES

Turn now to the mimeograph packet you received upon entering the session this afternoon. Hopefully, your speed reading facility has enabled you to completely digest these materials.

Let's begin with the buff color page on which are stated the aim and purposes of the program and the objectives for the child. The key words and phrases in the aim are problems, tasks, attention, information, sensory, and perceptual motor functioning. Independently and collectively these words consitute certain assumptions and point toward hypotheses for investigation. For example, problem solving is a useful method even with "younguns." Tasks can be rich with appropriate challenge, curiosity, and also explicit demands for performance. Attention can be captured and it may be lengthy. Relevant information gathering is experiential and it can be guided. Attention to relevant sensory cues is essential to task or motor performance. Optimal perceptual motor functioning is a requisite of efficient movement in most situations. These key words within the context of the statement of aim serve

as the focus and parameters of the program, and provide direction for statements of hypotheses.

The stated purposes of the program are fairly explicit and should not require further explanation. A few comments, however, might be in order. The first purpose is not intended to prevent the child from practicing at home, but rather to assure us of always designing an environment in the program which extends some home experiences, but more important introduces new emphases and experiences. The last purpose no doubt raises the question "how do you ascertain the developmental level?" The explanation of this will be included later in a discussion of Task Concept.

The objectives stated for the child are relatively obvious. They are purposely more general in nature than those devotees of Mager would like. Be that as it may, these objectives serve to generate appraisal questions regarding each child's periodic progress in each Semester's program. They also serve as the basis for determining the nature of tests and instruments needed for research in developmental movement.

PROGRAM PLANNING

Your attention is called to the blue color page in the packet. This material describes what I refer to as the mechanics of operation. Much of this is now in a fairly automatic stage which permits us to spend full time on program concepts and their implementation. In a period of three years a total of fifteen faculty members have been involved in developing plans of experiences and specific tasks for use in the program. A few of us have also designed and built the original equipment unique to the program. Generally, insights gained from working with the children in one semester have led to program changes, if not a completely different approach the following semester. Results of independent research studies in the Department also contribute to the rationale for change or the initiation of new ideas.

Today, I will share with you a bird's eye view of a developing schema we hope to use all year and improve through action

Aquatic Area

The Aquatic Area will receive brief attention today, not because it is any less important, but I realize that only few of you may have this type of facility available. Ours is 1909 vintage, but its hand made filters respond nobly to tender loving care.

Your attention is called to the Aquatic Area Guidelines included in your packet and color coded green. The all pervading goal is comfort in the water, and achievement of the ability to move one's self effectively in different directions and through space in the water. The child's attention in the Aquatic Area is also focused on relevant sensory input, but frequently this can occur only when the child has reached a level of comfort in the water and confidence in himself and his teacher.

The four major experience areas, adjustment, face in the water, propulsion, and entry are used simultaneously with most children. The sequential experiences listed under each are task oriented from simple to complex. In no way do we approach the Aquatic Area as a "Learn to Swim" segment of the D.M.E. Program. Many children do in fact accomplish recognizable swimming strokes. Even a few earn a beginning swimmer card when their D.M.E. Aquatic Achievements match the A.R.C. requirements.

Gymnasium Area

Why does one choose to use certain experiences over others in any program, pre-school or elementary level? This is a question frequently raised by teachers in the field, particularly during the past four years, and asked no less by myself since the inception of our D.M.E. program.

Beginning with the question, "what kinds of experiences will elicit attention to relevant sensory input?" we have gradually evolved a schema that shows promise with much additional work needed. We are using three major areas or categories of

movement tasks: (1) Interception-Projection; (2) Stability to Instability; and, (3) Body Awareness.

The Interception-Projection area has two independent, but integrative factors. Interception in this context refers to use of the limbs or total body to receive the force of varied size, shape, and weight objects. Variables include speed, distance, height, angle. A few sample objects include a balloon, swinging cloth dummy, bowling ball, and football. Projection refers to use of the limbs or total body to propel an object through space be it the body or some object. These two factors may be practiced independently or integratively.

The area of Stability to Instability also has two factors. First is the control of one's body with a very stable base of support on a continuum to near instability. How close to instability can a child be and still have control of his body in a movement task. Second is the factor of the equipment providing a surface from stability to gradual instability. These two factors, body control—on varied equilibrium surfaces--are not mutually independent.

In Body Awareness, the last area, we are presently concerned with only two dimensions. These are (1) the knowledge of where one's body is in space; and (2) adjustment to space required by one's own body. (This might better be termed body spatial awareness.)

Time does not permit extended examples in each of these major areas which form the rationale for experiences or tasks designed for inclusion in the program. It should be noted that within each area tasks are normally rated from simple to complex. Complexity is partially determined by the number of modalities required; descriminate power needed; and use of prior information. Please turn to the white page in the packet. This incomplete sample sub-schema of the stability to instability area will provide you with some notions of task complexity as determined by use of the body and nature of the equipment. Sequence difficulty in regard to body use is illustrated at the top of the page, reading from left to right. Sequence difficulty inherent in the equipment is reflected on the left side of the

page reading from top to bottom. The floor provides the most stable surface, and the cable drum provides an almost unstable surface with its constant movement. The developmental concept of task difficulty can be found in each piece of equipment. Child A who can cope with only a relatively stable surface and only with his total body can utilize the same piece of equipment as Child B who has achieved excellent control. (example maze walk and doubles hop). However, Child A probably should not attempt even the simplest task on the Bongo Board, whereas Child B may be near the simple task end of that piece of equipment as compared with the Floor Board.

To add to your bird's eye view of the program, I have prepared a film which will illustrate some of the concepts underlying the rationale for program experiences. I wish to emphasize that these films were made at random on the third day of this semester's program. Exploratory behavior and children and teachers getting to know each other are still much in evidence. I call your attention to the brief film outline on the yellow color page. The chronological ages cited are used for your reference only. Viewing Guide.

TASK ANALYSIS

The task is critical! What do you want the child to achieve or experience? Instead of selecting a task such as walking a balance beam obstacle course and then deciding how to use it, try another approach. What movement behavior do you wish to elicit. In the case of our schema, which sensory modalities do we want utilized. Suppose you want a child to attend to auditory input as a principle means of juding weight and speed of an on-coming object. You may be fortunate to have a "Beep" ball, originally designed for blind children. Otherwise, construct a tube or trough with material such as tin or hard plastic that will be sound producing, particularly with balls having sound producing covers, e.g., whiffleball or plastic golf ball. As a child practices catching a ball rolling down the trough, sight unseen, he soon relies on

sound as his only means of information.

I have selected from another film of ours a few scenes which illustrate the importance of the nature of the task. The procedures for task development are as follows:

1. Describe the movement behavior desired.
2. State the one or two concepts most important in the task.
3. Which sensory modalities should the task require the child to use to achieve success.
4. Is the task sufficiently challenging for this child?
5. Can the equipment and task be modified to accommodate a wide developmental range somewhere in the 2-6 year span if not the entire four years?

Please turn to the green color page on Task Analysis Film Outline. This information may help you view this short sequence in a different manner. These scenes are from a long film, gym and pool, and they were specifically planned rather than taken from the program.

In each one of the tasks viewed, it was first decided what behavior and sensory modality input were we seeking. Then, the tasks were designed and equipment followed. It was either selected from available items, or obtained or constructed for the particular task.

Recalling the white sample schema sheet, the same procedure was followed with one exception. The equipment was pre-selected and ranked from stable to unstable to provide a sequential order of difficulty in changing surfaces.

EVALUATION

"How do we know?" is now one of the most frequently asked questions of persons working in this area. Once again, there is little precedence from the literature to aid us in selecting appropriate evaluation instruments.

Reports of a potpourri of studies of motor achievement of young children, ages two to six, were published between 1930 and 1937. An analysis of each one readily pin points their deficiencies in regard to my concerns for assessing the perceptual process as a function of motor performance. Even

performance norms on movement patterns are essentially missing. Time does not permit a full discussion today of this very important aspect of a movement program for pre-school age children.

I do wish to share, however, with you the major hypotheses I have developed for use in the research design of our D.M.E. Program:

1. Children who participate in a long-term perceptual motor enrichment program during the pre-school years will exhibit a greater proficiency in the performance of selected movement tasks during those years than will children who have not had the advantage of participating in this program.

2. The concept of self in movement in selected experiences will increase in a positive direction as the child participates in a long-term perceptual motor enrichment program. These increases in positive self concept in movement will be greater than those exhibited by children who have not had the advantage of participating in this program.

3. Children who participate in a long-term perceptual motor enrichment program will exhibit achievement of higher levels of performance in selected movement patterns than those exhibited by children who have not had the advantage of participating in this program.

These final hypotheses essentially were derived from many sources, with the observational method as the primary one. As you well know, the progress observed over time and children contributes greatly to strong beliefs often developed concerning the beneficial effects of a program such as this. Even systematic observational recordings of achievement are not sufficient evidence of the efficacy of this program. A strong hunch that it "does something for the child" must meet the scientific test.

Therefore, you can well understand that with this insistence on appropriate research guidelines coupled with the virtual absence of valid instrumentation why we are slow to publicize specific results. Yes, we have, as one newspaper reporter stated, "mounds of data," but it can only serve as

pilot information at this stage. Several of us are in various stages of instrumentation development. Meanwhile, we continue to refine current evaluation methods used in the program.

PERCEPTUAL-MOTOR DEVELOPMENT PROGRAMS FOR CHILDREN WITH LEARNING DISABILITIES

Dr. Elmer Kane
Director of Windward School
White Plains, New York

This subject of perceptual-motor programs and learning disabilities raises two questions. What are perceptual-motor development programs and who and what are children with learning disabilities? There are some distinctions between deficits and disabilities. One of the possible disabilities is neurological damage. As we deal with children we need to consider them as having an input system and an integration system, and an output system. The input system consists of the sensory modalities by which we receive sensation and information. Integration is what happens to this sensory stimulation to give it meaning and the expressed is a function of the output system. If there is neurological damage very likely we are dealing with a deficit or dysfunction in the integration system. Neurological dysfunction either by virtue of damage, birth trauma or genetic structure. We also have a vast category of orthopedically handicapped individuals who possess primarily output deficits, as well as some input deficits, but not necessarily the integration. Furthermore, there are other children who are unable to learn because of a deep emotional disturbance. The term-learning disability- will not apply to those cases except to a mild degree. I feel that when used in school, the term-learning disability- like dyslexia, is fast becoming a catch all label. While we can not categorize a specific disability we can diagnose with some precision. When we attempt to say the child has a learning disability, as used in school, it generally means these children by some criteria are not adjudged to be successful learners. They are poor learners, slow learners, and most typically a 'disabled reader." Children who by all measures of potential should learn but who are not learning as well as their classmates because of inadequate development in one or more of the sensory mechanisms have a learning disability. Their input system is not functioning as well as it should be and this is the dynamics of the concept of readiness. Children are very stubborn little creatures; they will not learn until they are ready to learn. The higher the level of integration of the sensory modalities, the greater the readiness for learning. Thus they will tend to learn at a more rapid rate and at a deeper level of

understanding and retention. How can motor development programs influence each of these different areas of readiness? When did speech become a sense modality? Children utilize tactile and kinesthetic input and deal with vision, which is one of the major themes of my discussion this morning. Since it's estimated that 80% of everything young people learn is learned visually, this has some important consequences and implications for physical education as well as the other disciplines. Vision is the dominant linear modality, but vision is very illusive. There is a difference between sight and vision: sight refers to the functioning of the organ - the eye; operationally how well it operates as an organic entity; how well it receives information; how well it is working is sight. Vision is the interpretation of sight, the attachment of meaning to what is seen in the retina and transmitted to the brain; an instantaneous matching process taking place. The brain conducts a search of the information in the brain to match what just went in and to give it meaning. Vision is meaning and understanding of sight. Those of you who deal with children in education are potentially the strongest contributor to the learning process. Vision in this sense is of extreme inportance to the physical educator. We have clinical evidence that children with half a brain (literally) could function. This is the biological concept of homeostasis whereby the body retrains itself in functional equilibrium. So if a deficit develops in one area there is a tendency to develop a plus in another modality. The audition of the blind becomes more acute.

Next some pronouncement of understandings in the field of learning theory: First, there is little, if any, learning without movement. Secondly, there is a unity to the human being; the more integrated the unit the higher the level of set for learning. Now what will perceptual-motor programs do? They do not attack cognitive learning nor do they deal with acquisition of skills. They do not deal with higher levels of abstraction. They do not deal with aviations, with the world of ideas. What they do is to set a seed bed for learning and once this readiness is produced; the unity of humans is right for learning. One of the first things we do in education is to ask children to sit still and pay attention. The child, however, may be physiologically and neurologically incapable of sitting still for very long. Children who are excessive movers, who have short attention spans,many times lack the ability to coordinate

movements in sequence. Next we want children to know where they are. We live in a space-time world, children need help to keep from being literally "Lost in Space." Where are they? How will they go from here to some place else? This takes us to the concept of directionality. We confuse children all the time when we ask them to point up or down. Up is over our heads or over the object. Up is a unity, it's consistent and that's what we need to have children learn. Why do we need directionality? In our country we read from left to right. Is reading from left to right biologically natural? Is this physiologically a preference? The Gesell Institute states that there is no biological preference to processing visual information from left to right. If this were not true many countries in which the language reads from right to left would be in trouble. Thus, directionality is a learned process and therefore can be taught. Biologically we are foresighted with two kinds of eye movements. There is no muscular connection via the nervous system and yet they work together. Some children need help in developing the use of two eyes as a team. The lack of developed of coordination between both eyes can result in amblyopia (the lazy eye) in which the child tends to depend on the use of one eye. Our function is to develop efficiency in eye coordination and then the integration of matching between systems. Can you hear what you see and see what you hear and can they be matched? A child in 3rd grade who reads orally and uses finger as a pointer for each word when he is supposed to read silently with no pointer is telling the teacher "I don't know where I am in space, I need to find and keep myself comfortably in one area of space by using my finger. I have a tactile reminder of where these words are. Second, I don't have enough confidence in these things so I have tc translate it into sounds so I can check the meaning of what is coming in this way. So he's making a loop system between seeing and hearing and hearing and understanding and he trusts hearing more than the eye movements at this point. He may also have had trouble in moving his eyes so he uses his finger because these skills are not highly developed he will have difficulty benefiting from reading. The struggle of the mechanics in reading is obvious in this child. Orientation in space, directionality, eye movement skills, hand-eye coordination and peripheral awareness are important learning.

The child with preservation problems has this problem. Figure ground configurations are underdeveloped in this child. The Russians say that all learning is motorically based unlike our view of the psycho-analytic view of intelligence. Evidence suggests that the Russian's point of reference may be right. Hedge in Canada found that the more stimulation given to an infant in the form of light, sound, feel, smell, etc. tended to develop the brain faster and the nerve cells develop at a faster and more significant rate. It was found that myelin was produced at an increased rate in these children of high stimulation. Hedge is telling us that we have a new definition of intelligence. Intelligence may turn out to be nothing more than the measurement of the efficiency of the human body.

(Slides and a narration composed this portion of the presentation)

Finally I want to impress on you what we ask children to do in the world of academia. We ask children to cope successfully with different functional forms of symbols such as manuscript writing, upper case, and lower; algebra symbols; arithmetic symbols; and musical notations. Children live in a world of symbols and unless they can cope with them they are in trouble. To help them to cope we must understand that the body functions as a unity so that all these sensory modalities have to be interrelated. Of these modalities,vision is the primary modality and to develop vision the teacher is in the best position. We have to give youngsters developmental opportunities or have them toss bean bags cross-handed across midline of the body as well as straight and sideways. There are many activities, the point is that the success in the gym is the best guarantee of readiness for academic performance in the classroom. Those of you who have had anything to do with movement education, which is the core of all this, can I think first be congratulated and secondly can more readily see the relationship between children with learning disabilities and the importance of motor development programs.

PLAY AS A MEDIUM FOR LEARNING

by
Mary W. Moffitt
Professor of Education, Queens College
City University of New York

Play has been created by children. It appears in familiar forms all over the world with but slight variations due to cultural differences. Everywhere, healthy children play with water, sand, sticks and stones. They climb, throw, jump, collect, match and sort objects they find around them. They create or convert what is at hand for play purposes. The children in Samoa select episodes from the adult world to dramatize in the same way that American, Australian or European children dramatize what they see.

The whole truth about what purpose play serves in the development of young children is still unknown but it appears that the value of play is more far-reaching than we yet realize. Gradually, we are learning that play contributes to the complex growth patterns that enable every child to become a functional human being.

Play activities provide for "information-seeking" behavior. We have known for a long time that play is a powerful inner force through which a child reaches out to interact with his environment involving movement and different sensory modes. He seems to learn more when he can move around, handle and manipulate objects. Through such sensory-motor activities, he learns much about the properties of matter and finds ways to adapt to a complex environment through experiences related to cause and effect. Children who are prevented from having a wide range of sensory-motor experiences in these early years, due to illness, over-protection or for other reasons, are not likely to develop certain kinds of percepto-cognitive information in the same way later on. Yet, there is an increasing pressure to curtail children's natural avenues for learning by restricting them more and more to passive behavior such as sitting and listening. Yes, even drugs are being given to quiet down the so-called hyper-active child when perhaps he may be responding only to his body's

need for movement. When adults attempt to impose restraints on movement to teach academic learnings instead of providing for active play, it often forces a child into what seems to be disobedience that results in further restriction of his movements.

Play provides for maturational needs of a body, rapidly changing in size and proportion to achieve balance and coordination. As a child climbs, runs, jumps, crawls, rolls and moves about in space, he has to make many modifications to the pull of gravity which affects his balance, distance and depth orientation and general movement patterns. Play provides practice of many different patterns of muscular movements that brings nerves, bones and muscles into harmonious control. When a child is able to achieve mastery of his body and direct it for his purposes, he develops an image of himself as a learner and a doer. This concept of self, in turn, becomes a vital force in both acquisition of knowledge and personality development.

Play provides opportunities for children to interact freely with one another as they verbalize thoughts, convey impressions and communicate ideas to others. Learning to work together on common projects or in solving problems and learning to play together is important for developing creative and cooperative individuals. Young children are generally egocentric. If formalized work is imposed too early requiring them to work quietly by themselves, they are denied opportunities for active socialization that is needed for total development.

Unfortunately the word "play" suggests different ideas to different people. Often there is an attitude that is a carry-over of "puritanism" when play was considered to be frivolous or even sinful. The lack of understanding about the value of play in education causes some parents and educators to insist upon the elimination of play activities. The concept of school for many of these adults is that of children sitting quietly at desks learning to print letters, numbers and to mouth words from a book. Since children are going to school earlier, this formal concept of schooling is being imposed earlier, when many young children have not developed the

perceptual-motor skills needed for the academic tasks imposed upon them. It does little good for a child to struggle to write numbers when he cannot deal with objects in different spatial relationships. Reading, while desirable, may impose a problem because he has not developed focal patterns needed for rhythmic scanning. When children have not developed the proper skills for certain tasks, they often become discouraged and stop trying.

What must a child learn in these early years for him to be successful in later school years? Dr. Katrina deHirsch[1] in her book, Predicting Reading Failures, indicates that many difficulties in learning arise from poor perceptual, motor and language development in the early years. Learning perceptual skills is not to be confused with learning information, however, if a child does not develop certain perceptual skills, his ability to learn information may be affected. Therefore, it is important that programs for young children will include those activities that will help children develop the skills they need for the tasks of learning to read, write, compute and comprehend other school subjects. There is accumulative evidence that such programs will plan for vigorous physical play, painting and drawing, construction of all kinds, work with sand, clay, manipulative materials of various types, and singing and dancing. It is these play activities that will help in the development of the neuro-physiological and psychological aspects of readiness to deal with the academic tasks later on. If a child's perceptual functioning is adequate, perhaps there will be less need for remedial help in the future.

Relationship of Play Activities to Perceptual-Motor Development

The following schematic drawing is an attempt to show the relationship of different play activities to perceptual-motor development, and cognitive development that are necessary for

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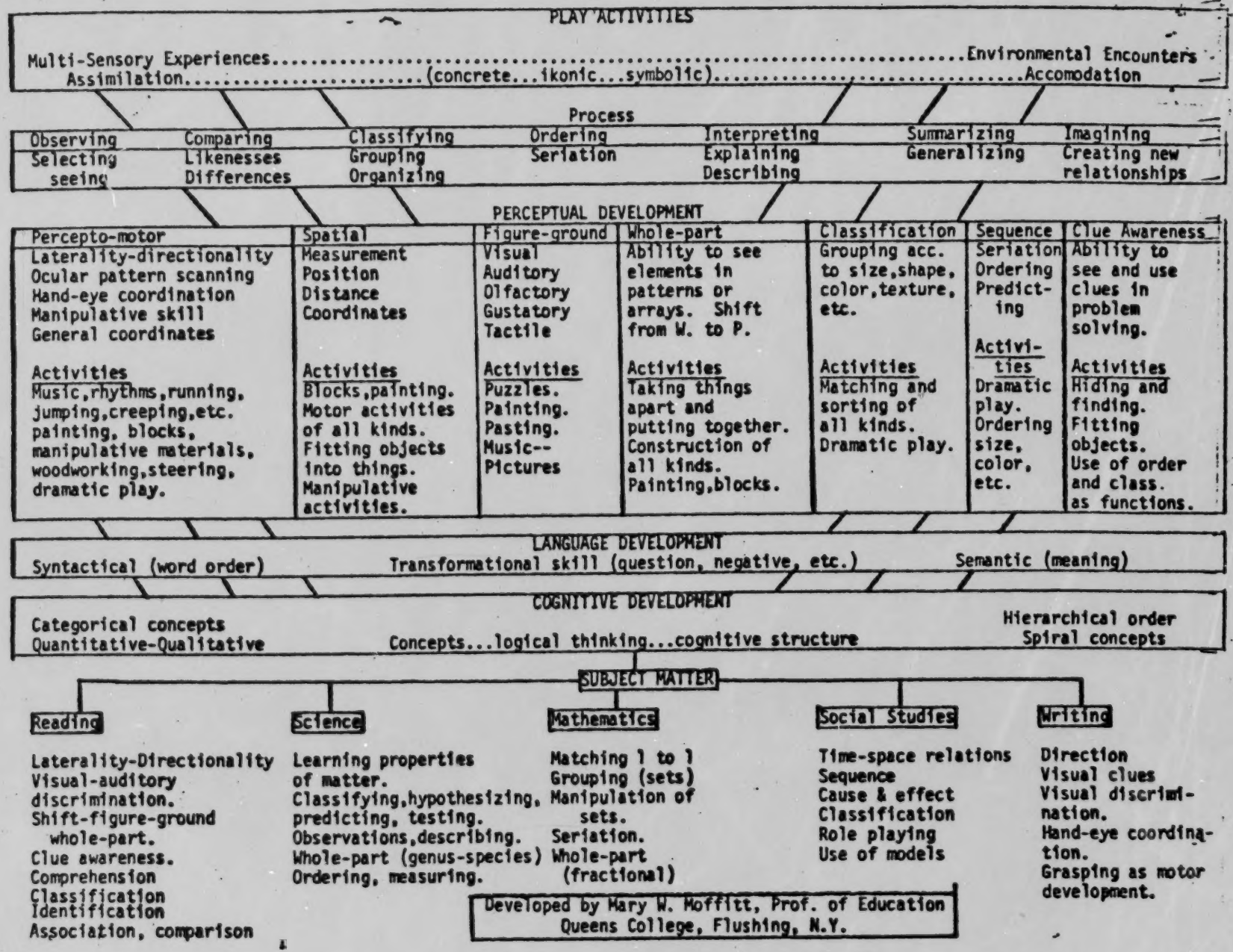
[1] de Hirsch, Katrina. Predicting Reading Failure. Harper & Row. New York, 1966.


PLAY ACTIVITIES
Multi-Sensory Experiences.....Environmental Encounters
Assimilation.....(concrete...ikonic...symbolic).....Accomodation
Process
Observing
Selecting
seeing
Comparing
Likenesses
Differences
Classifying
Grouping
Organizing
Ordering
Seriation
Interpreting
Explaining
Describing
Summarizing
Generalizing
Imagining
Creating new
relationships
PERCEPTUAL DEVELOPMENT
Percepto-motor
Laterality-directionality
Ocular pattern scanning
Hand-eye coordination
Manipulative skill
General coordinates
Activities
Music,rhythms,running,
jumping,creeping,etc.
painting, blocks,
manipulative materials,
woodworking,steering,
dramatic play.
Spatial
Measurement
Position
Distance
Coordinates
Activities
Blocks,painting.
Motor activities
of all kinds.
Fitting objects
into things.
Manipulative
activities.
Figure-ground
Visual
Auditory
Olfactory
Gustatory
Tactile
Activities
Puzzles.
Painting.
Pasting.
Music--
Pictures
Whole-part
Ability to see
elements in
patterns or
arrays. Shift
from W. to P.
Activities
Taking things
apart and
putting together.
Construction of
all kinds.
Painting,blocks.
Classification
Grouping acc.
to size,shape,
color,texture,
etc.
Activities
Matching and
sorting of
all kinds.
Dramatic play.
Sequence
Seriation
Ordering
Predict-
ing
Activi-
ties
Dramatic
play.
Ordering
size,
color,
etc.
Clue Awareness
Ability to
see and use
clues in
problem
solving.
Activities
Hiding and
finding.
Fitting
objects.
Use of order
and class.
as functions.
LANGUAGE DEVELOPMENT
Syntactical (word order)
Transformational skill (question, negative, etc.)
Semantic (meaning)
COGNITIVE DEVELOPMENT
Categorical concepts
Quantitative-Qualitative
Concepts...logical thinking...cognitive structure
Hierarchical order
Spiral concepts
SUBJECT MATTER
Reading
Laterality-Directionality
Visual-auditory
discrimination.
Shift-figure-ground
whole-part.
Clue awareness.
Comprehension
Classification
Identification
Association, comparison
Science
Learning properties
of matter.
Classifying,hypothesizing,
predicting, testing.
Observations,describing.
Whole-part (genus-species)
Ordering, measuring.
Mathematics
Matching 1 to 1
Grouping (sets)
Manipulation of
sets.
Seriation.
Whole-part
(fractional)
Social Studies
Time-space relations
Sequence
Cause & effect
Classification
Role playing
Use of models
Writing
Direction
Visual clues
Visual discrimi-
nation.
Hand-eye coordina-
tion.
Grasping as motor
development.
Developed by Mary W. Moffitt, Prof. of Education
Queens College, Flushing, N.Y.

success in academic subjects.

Both Bruner and Piaget have expressed the point of view that multi-sensory experiences obtained through environmental encounters with the concrete, three-dimensional world are important. It is through sensory experiences that children build a repertoire of "referents" that can be used for interpretation of new experiences. These referents form a basis for classifying information and the child indicates this by saying, "It is like...."

Bruner explains learning in three modes as concrete or real, ikonic or imagery, and symbolic representation. For example, a cup has many dimensions. It may be big, little, blue, etc., but with many experiences with various kinds of cups a child begins to generalize about cups as "cupness." Thus he may carry a mental image of a container referred to as a cup in his mind. Later, the mental image helps him to recognize a picture of a cup or the word symbol of "CUP" as representing the object.

Piaget has explained the relationship of sensory experiences to learning as assimilation-accomodation. Children take in or assimilate stimuli and as they act on it, or accomodate it to their conceptual structure they are now able to assimilate new stimuli and in this manner a meaningful schema or concept is developed. It must be remembered that a concept is never complete but may be expanded through new information and new experiences.

The many aspects of sensory experiences are processed through observing, comparing, classifying, ordering, interpreting, summarizing and imagining. Each of these processes is an integral part of the way a child acts upon the stimuli he receives. As a child develops his language and is able to speak about what he sees, hears, feels, tastes and smells, he extracts meaning from his experiences, which in turn helps him to build his cognitive structure in various ways.

As one can see from the schematic drawing, there is a circular relationship of the parts that make up the whole. Each is dependent upon other parts. Play activities provide

the momentum through which a child can make a more balanced thrust towards maturation. It has been recognized for a long time that there is a close relationship between perceptual development and school achievement. If a person selects any one of the subject areas and asks the question, "what does a child need for success in this area?", he is struck by the fact that all of the above mentioned activities are basic to learning to read, write, for understanding science, mathematics, social studies and other areas.

An attempt will be made to describe in more detail, the specifics of percepto-cognitive development and the activities that may be important in each area as shown on the schematic representation.

PERCEPTO-MOTOR SKILLS

Body Image - Laterality is an internal realization that the body has spatially oriented parts such as a right and left side, a front and a back, which must be coordinated. A child must sense that he is an object in space and that he takes up a certain amount of space. The body may be used to measure space as a child finds out where he can reach, step, jump and what he can get into, through and around. Neuro-muscular control is promoted as a child assumes various positions and when he propels his body through space in different ways. Directionality is an external referent by which the child learns to use the horizontal and vertical coordinates in the environment for relating himself to other objects in space. His eye must accomodate to space at various focal points such as near, mid and far areas. Some children have trouble adjusting to the illusion of size related to distance. The airplane which is seen as large on the ground is explained to be "shrinking" when seen as a tiny object in the sky.

Motor Patterns - Running, jumping, skipping, creeping, throwing and the like requires balance, control and muscular strength. Bones and muscles grow according to usage. The muscles are arranged in pairs and must be used to develop reciprocal action that is necessary for efficient movement. Many movements are dependent on hand-eye coordination. All kinds of manipulative skills involve the extension of the body

through the use of tools. Certain ocular patterns are a part of hand-eye coordination. Both eye focus and eye following are important. Where does he look? Does the eye follow the hand in a rhythmic fashion? Many activities such as painting, pushing a small truck along the floor, steering a bicycle, bouncing, throwing and rolling a ball provides for near focus and eye following patterns.

PERCEPTION OF SPACE

Measurement - A child must acquire spatial accomodations for objects in relation to other objects in a variety of ways. Comparative forms require a referent when differentiation is made for how long, how high, how deep and the like.

Position - Up, down, above, under, aside, below, in the middle, are but a few of the words that are used to designate position of objects in relation to other objects. A child needs to learn how to organize objects and himself in space by the positions so designated.

FIGURE-GROUND

Figure-ground is a term applied to the way a child selects a certain stimulus from a complex background by ignoring all other stimuli. Perception of form, texture, smell and taste is dependent upon what a child picks out to attend to. Some part will stand out as "figural" and details noted while the background will tend to fall back and lack clarity. Ability to concentrate is related to how long a child can attend to a specific configuration.

Configuration - A child needs to have a clear image or a basic configuration of an object if he is to make some differentiation of it from among other material. Special problems may arise in figure-ground differentiation when items are embedded in extraneous detail or only partial figures are shown. Children are often asked to select a particular item from a picture with many other details. If a child does not understand how to use certain clues or he lacks a clear image of the object, the task may cause some difficulty for him. There is some relationship between motor development

and figure-ground differentiation because it has been found that children score poorly on figure-ground if their motor development is poor. Language disorders may arise, too, from inability to hear sounds distinctly which is another form of figure-ground differentiation.

Symbolization - A child needs to have some experience with concrete objects if he is to fully recognize its symbolization. Some children have difficulty in recognizing specific symbols due to inexperience in handling, seeing or hearing. Painting is an activity that is particularly useful for learning symbolization. Through painting and drawing, a child may learn that he can represent the three-dimesnional world through line and form and thus develop his own symbols. Clay is another media that may be used for this purpose. When a child makes his own symbols, he can better accept the symbols of mathematics and those used to represent sounds for reading.

WHOLE-PART LEARNING

Learning to see the parts or elements that make up the whole is related to reading and other academic skills. Young children tend to see the whole rather than the parts although some children may see some small detail. Piaget speaks of this tendency as "centration" or in other words, he tends to become fixed on one element within the whole. On the other hand, if two shapes are similar but differ only on interior detail, children may fail to see the interior detail as part of the whole pattern.

Reading, for instance, requires the skill of looking at individual letters and then at the word as a whole. Some children learn to identify words by configuration or shape of the word while others look at the elements or individual letters and them at the whole word. There are many activities that are related to whole-part learning. Construction of all kinds such as block-building, woodworking, collage, painting are some of the activities that require the child to assemble or note discrete parts that make up the larger whole. Taking apart and putting together provide opportunities for learning to look at sequence and order of parts as they relate to each other.

CLASSIFICATION-SERIATION

Classification and seriation are cognitive processes that result from a child's ability to perceive the attributes of various kinds of materials and organize them in some class or category. Many concepts in science and mathematics are dependent upon the ability to place objects in various kinds of categories or put them in ordered arrangments. Activities for matching and sorting of a wide variety of objects for size, shape, texture and the like are essential and involve perceptual acuity.

LANGUAGE DEVELOPMENT

Language and thought are closely allied. As children work and play they learn to talk about the attributes of objects and describe what they are perceiving. The English language, of course, has its own word order and the child learns to transform the syntax in various ways. Actual experience provides for ideas associated with that experience that help to build meaning for the words he hears and learns to use.

COGNITIVE DEVELOPMENT

Basically, cognitive development is composed of ideas or concepts. These may be both quantitative (many, more, few, numerical, etc.) and qualitative (warm, cold, rough, smooth, etc.). As children build concepts about their world, they build on past experiences and understandings. Bruner speaks about learning as "continual deepening of one's understanding ...that comes from learning to use ideas in progressively more complex forms[1]." Learning proceeds in a spiral order. A child can learn something new because he has a schema into which the new information may be fitted.

The schematic drawing attempts to show the relationship of processes, perceptual intake, language and cognitive development in a circular fashion as indicated by the lines. Each part is related to the other.

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[1]Bruner, Jerome. The Process of Education. Harvard Press, Massachusetts, 1966. p. 13.

ACADEMIC SUBJECTS

It should be noted that the skills for academic learnings are the same as those that are found in the schema under perceptual development. It is important, therefore, to provide the kinds of activities that are important for the development of perceptual skills. It has been noted that if a child does not succeed in learning to read, for instance, that he is referred to the remedial teacher who frequently has to work with perceptual deficiencies before the child can progress with the task of reading.

It is apparent that many of the activities that are called "play" are directly related to the development of various kinds of skills that children need for achieving success in academic subjects. Nothing has been found to take the place of play and interest and mental energy when a child becomes involved in working with materials and pursuing his ideas.

Play activities should be planned to provide for optimal learning conditions. This means that materials should be well selected, strategically placed for good use. Adequate amounts should be provided so that children may work without the frustration of waiting too long for turns. Time for play is essential. However, this does not mean that children will work at academic work and then have ten or fifteen minutes of "free play." It means that teaching becomes a process of diagnosing the needs of children and planning for individual progress in a total program.

Children need and respond to activities that contribute to both perceptual and conceptual learning. This demands that the environment present challenge to children. When there is no challenge, attention deteriorates or fluctuates with the result that learning may be affected.

Pestalozzi said in 1802, "Thus to instruct Man is nothing more than to help human nature develop in its own way and the art of instruction depends primarily on harmonizing our message and demands we make upon the child with his power at the moment[1]."

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[1]Pestalozzi, Johann. Education of Man. Philosophical Library, New York, 1951.

CHILD STUDY AND INSTRUCTIONAL TEAM
PANEL DISCUSSION

Dr. Wunderlich - Pediatrician

The unity of the child and the need and importance of a unitary view of children will be stressed throughout this panel discussion. The child's body, personality, and learning occur as different but related manifestations of the same individual. An important factor in the effectiveness of that individual as a learner, as a person, is his history of past and present illness. Teachers and physicians should be more concerned with subtle ongoing disease, not just the 10% or 20% of children who have chronic or handicapping conditions. Recognizing acute diseases is like seeing the top of an iceberg; the largest part is submerged and not easily identified. Three of these subtle, frequently identified problems are nutrition, allergies, and infections. The closing point is that teachers must know the past medical and educational history of the child, not only for this school year but from birth. A careful detailed analysis of events of a child's past life can often provide the key to management of present problems.

Dr. Grossman - Child Psychiatrist

From my experience as a child psychiatrist in evaluating and treating children suffering from many types of learning disabilities. I have observed deficits which were associated with minimal cerebral dysfunction, hyperkinetic syndrome. Frequently accompanying secondary symptoms of behavior disorders, emotional problems, low self-esteem, poor self-concept, frustration, and poor interpersonal social relationships have also been observed. The child with a visual-motor or visual-spatial-perceptual problem which goes unrecognized or without remediation usually is stigmatized and rejected so he gives up on his school work and on himself, too. Rather than not being noticed at all, he attracts negative attention through recognition as a "bad child." The converse of primary or specific learning disability associated with secondary emotional difficulties is primary emotional disturbance associated with secondary learning disabilities.

Children may show an inhibition of learning as a result of early childhood experiences in the family, especially from the person who is responsible for caring for the child as an infant. In clarification,

the child transfers his attitudes and feelings from this person to his teacher, the parent surrogate. The child may show characteralogic disturbances associated with learning such as fear of harsh, punitive, strict, rigid, or authoritarian figures like some teachers; a fear of competing, or aggression on the part of his peers. In this case a child's power struggle with his parents transfers to the school or social situation. Overprotection may lead to a low frustration tolerance level which can render the child unable to meet the challenge of the pressure and stress of school or his capacity for competition. Another facet of this problem is a socio-cultural factor; the case where the family-home situation does not provide the support or guidance for the child as readiness or incentive for learning. Children are dynamic individuals affected by many factors which often are taken for granted; the teacher must be aware of and able to offer developmentally appropriate experiences for these troubled children.

Dr. Melby - Optometrist

My portion of this description of the varying roles of specialist in a team approach to learning will include a description of a procedure for screening children with learning disabilities, a definition of vision and a slide presentation. The test items or tasks the children are asked to perform are as follows:

a) walking a balance beam
b) hopping on right and left feet
c) knowledge of directionality and body scheme control
d) far-near eye movement
e) reproduce geometric forms

On the basis of these tests I have been able to differentiate between achieving and non-achieving children.

Vision is more than visual acuity - 20/20 acuity. The optometric profession offers literature related to vision such as:

What Does 20/20 Vision Mean?

A Dynamic Theory of Vision

What learning Lenses Mean in the Beginning School Grades and Why

Some of these topics which the optometric profession are examining are controversial and still being studied by the Optometric Extension Program. SLIDE PRESENTATION FOLLOWED

Mrs. Cawthorne - Physical Therapist

I am going to focus on some aspects of evaluation; they may be minor points but in my opinion they are certainly important points. First we have to look at the skill of the evaluator and his/her ability to look at the child as a person, not just as arms and legs. Often the evaluator will jump to conclusions, such as when a child fails to balance for 10 seconds. The interpretation could be that the child has a balance problem when the child may have weak ankles or could have stepped on a nail and this bothered his performance but he was afraid to tell you.

An evaluation should include balance, gross-motor, fine-motor, directionality-laterality, and coordination items. In addition, I include measures of posture, sensory functioning, body awareness, and rhythm and timing. I think all of these aspects of perceptual-motor ability are real necessities, not just whether the child can hop or skip.

In closing I want to speak against pass-fail scoring as a measure of performance. I think it is more important how he does it, rather than if he does it. If a child is able to balance on one foot for 10 seconds but windmills his arm the whole time; I would say this child probably has a balance problem even though he managed to pass the test.

It is important for us to take a good look at ourselves as evaluators and find out if we really are looking at the whole child as an integrated being and then look at contributions we can make to help the child function in a happier, more contented and functional state.

Miss Ammons - Cognitive Evaluation Specialist

I would like to point out that I am not a perceptual-motor specialist, rather, I am a specialist in cognitive skill and instructional theory and assessment of cognitive skills. I am part of a team that is concerned with children who have perceptual-motor disabilities.

Learning, reading, and other cognitive skills are not only in the cognitive domain, many of these things are partially in the psychomotor domain as well. Obviously, if the child does not have cognitive skills - recall, classification, and so on - he is going

to have trouble. But it also works the other way. If he does not have the psychomotor skills he is going to have trouble in reading. Much the same thing goes for mathematics.

My responsibility is to evaluate the child's cognitive skills and to provide information concerning the level of performance at which the individual is operating. By knowing whether the child is operating on a concrete level or an abstract level of intelligence an instructional prescription can be made and the teacher can move from that point. This is the contribution that a consultant in evaluation can bring to an instructional team.

Virginia Gates - Reading Specialist

As a reading specialist I am delighted about the national emphasis that has been placed on reading. But I am also very much concerned that there may be too much wheel spinning without much forward progress if the responsibility is charged to the remedial reading specialist alone.

Physical education teachers have a firm ground on which to contribute to a reading program. The trend to physical education in elementary schools is certainly one of the best educational movements in a long, long time. Speaking of movements, Dr. Getman, at the 1970 Perceptual-Motor Symposium in Cincinnati, said, "It is an impossibility in the human being or in anything else, as far as I know, to learning without movement."

The reading specialist should start with a child at a level where success can be achieved. Word attack techniques, vocabulary growth, and confidence in story comprehension are worked on but usually for only 2 to 3 hours per week for an individual child. The physical educator has much to contribute to the learning team as a person who teaches the child, not the subject.

Critical reading diagnosis often indicates that a pupil lacks directional concepts, has weak lateral preference, is unaware of body space relations, is awkward and has problems in sequencing concepts and organizing information. These are things done in physical education. These deficits are underlying causes or contributing factors to the symptoms of poor reading abilities. True, perceptual-motor training is bridging the gap but for the younger children by developing the necessary physical moving experiences so

that left-right, top-bottom, front-back, over-under, above-below, to-through, around-across, straight-circular, and other understanding are learned by the child from inside to outside. He learns by doing; knowing how a direction feels and where it takes him. In body movement, he learns how to coordinate his hands and eyes, how to control fingers, what happens next, cause and effect association, estimates of time, space, challenges, and limitations. You may note the similarity of some of this terminology to that used in courses called science, English, history, and math. But if a child has difficulty with these learnings, how is he usually taught or retaught? Often through repetition of the same methods and materials which failed him in the first place.

To return to the relationship of reading and physical education-how can a child interpret symbolic images if he is without a basic frame of reference learned through his own body movements? It seems to me that specialized expertise in physical movement is needed in addition or even prior to reading techniques. To site a case to illustrate the effectiveness of such cooperation, a teenaged girl judged and treated as mentally retarded might have fallen even lower on the scale of intellectual ability had it not been for some very professional physical education help. Now there was no miracle. The girl probably never even will approach the normal achievement levels for her age, but she has made dramatic enough improvement so that she is now at a beginning reading stage. Now it is true that this improvement was not accomplished as simply or directly as I've just stated it; others were involved. A full team approach was involved to diagnose and decide treatment priorities. The girl's state of health was first ascertained. Certain recommendations were made regarding allergies, for instance. A vision examination revealed the need for mildly corrective lenses. Psychological assistance was given in a few sessions with the family. The sensory motor perceptual training was begun after reading analysis found that even readiness skills were not feasible until a degree of motor coordination was attained. Now quite a few school systems are forming such multi-disciplinary teams but they are for beginning elementary grades. It will be some time before the effect is felt in the classrooms, and meanwhile some child goes through the motions of learning letters and words in order to read. As long as he sees them as a

spectator sees instead of as a participant, his progress will be slow, his learning vicarious and unsure. A working relationship between the physical education educator and the reading specialist can be a means by which the child can put it all together.

The panel wisely made concise presentations which allowed time for a very meaningful exchange to occur between the panelist and conference participants. Due to the specific nature of the questions and replies they were not included in these proceedings.

PERCEPTUAL-MOTOR DEVELOPMENT IN TEACHER PREPARATION PROGRAMS

by
Dr. Virginia R. Crafts
Illinois State University
Normal, Illinois

In considering the perceptual-motor development area in teacher preparation, there are a number of questions which must be asked. Among these, the following might be considered major:

What is meant by perceptual-motor development?

To what segments of the population is this an area for educational concern?

What do teachers need to know about perceptual-motor development?

How can the area of perceptual-motor development be an integral part of a dynamic updated preparation program?

How should teachers learn about the area?

In relation to the first question, what is meant by perceptual-motor development, Cohen offers a definition of some worth:

> All of these functions of the body that have a voluntary component and, of course, depend on some kind of sensory feedback and some kind of sensory perception prior to the motor act would fall into this category. It would be hard to think of a motor act that does not require either prior perceptual awareness of some kind of stimulation in the environment, or at least require some kind of sensory feedback during execution of a motion (1, p.85).

If one adds to this concept the idea that there is also a sequence of development which provides for an increase in skill and greater complexity in function, the phenomenon of perceptual-motor development is at least generally described.

There are some educators who feel that the linkage of such words as "sensory" or "perceptual" to the words "motor learning" is unnecessary; they prefer the term "motor learning" to describe the purposeful integration of movement into effective patterns of action. Lockhart seems to take this position but she elaborates by saying that motor learning is

instigated through sense receptors, both internal and external in nature, is integrated through the nervous system, and is modulated through the response mechanism into movement (5, p.35). The involvement of sensory, perceptual, psychological and cortical mechanisms is hence recognized. To Lockhart, motor learning is perceptual-motor learning. For some persons, however, motor learning is more acceptably defined as relating to a sequential, orderly progression in fundamental movement patterns.

It may seem a matter of semantics as to whether one uses the term motor learning or the term perceptual-motor learning. It is probable, however, that the addition of the prefix, "perceptual" and the use of the hyphen have served to draw attention to the close relationship between perceptual activity and motor activity. For too long there has been attention given primarily to the mechanics of motor acts; now focus is also being turned to perception and to the interrelationship between perception and the motor act in describing how man learns and responds during various maturational stages. Kephart's concept that "meaningfulness is imposed upon perceptual stimulation through the observation of the perceptual data along with changes in the data as motor manipulation occurs," is the basis for what is being called "the perceptual-motor match" (4, p.29). Simply stated, the perceptual-motor match is the process of combining perceptual information and motor information into a meaningful whole. Thus it is, that within the phenomenon of growth and development, motor development and perceptual development must of necessity be viewed not as completely discrete areas but rather as areas which overlap and interrelate. This point of view does not rule out consideration of perceptual development and of motor development as special functions; as a matter of fact, a thorough knowledge of each is necessary in order to understand the interrelationship that can and does occur between them. Perception, or the act of perceiving, is generally considered to consist of the selection, organization, orientation, and interpretation

of sensory stimuli so that meaning is given to the event or object involved; obviously, past experiences, as well as personal internal stimuli and external environmental stimuli are involved in the perceptual act. In relation to sports, Hubbard states that "perception...involves sensing environmental changes, discriminating essential cues, assessing their relative import, and selecting the most important action in terms of our own and our opponent's ability" (3, p. 125). In general, it could be concluded that if the goal is to develop the fully functioning person, development of the ability to perceive, to interpret, to relate and to attach meaning to stimuli and the ability to move and respond through movement should proceed simultaneously as an ongoing experience. This kind of experience would then constitute perceptual-motor development.

The second question I raised focused on identification of the segments of the population for whom perceptual-motor development should be an area of educational concern. Perhaps the best way to answer this question is to state that MAN MOVES IN ENVIRONMENTS FOR PARTICULAR PURPOSES. This concept does not refer to some of mankind but rather <u>all</u> of mankind - the man, the woman, the child, the wealthy, the poor, the strong, the gifted, the weak, the slow learner, the black, the white, the cardiac case, the emotionally disturbed. Each and every person, upon birth, is thrust into the position of having to relate to one or more environments as he seeks to satisfy personal and social needs; he moves to survive, to discover and understand himself and his environment, to control and adjust himself and his environment and to communicate and express himself and fulfill his needs. Regardless of how well or how poorly a person is equipped to perceive himself and his world and to respond to them, he does find himself involved in the process. It is a universal occurrence. And thus it is that <u>all</u> segments of society must be cognizant of perceptual-motor development as an educational concern. The educational goal becomes that of helping all persons realize the fullest and

best perceptual-motor development possible within the limits imposed by unalterable conditions.

What do teachers need to know about perceptual-motor development? It is becoming increasingly clear that not only all teachers but also any person who works with children, youth and adults in teaching, guidance, or rehabilitation roles should have a very solid foundation in growth and development. Secondly, as a part of that area or as a specialized experience offered in the physical education area, there should also be strong emphasis upon the nature and role of normal perceptual-motor development and learning during the early years of life up to about age seven and formation of a basic and inclusive perspective about normal perceptual-motor development and learning for all ages. The multi-disciplinary foundations of perceptual-motor development should be studied in relation to this end. Visual perception, Piaget's theory of cognitive development and movement patterns are part of this approach. Third, knowledge about deficit perceptual-motor development and learning is needed both on a broad basis and on a specific basis as it relates to the nature of the vocation which a particular teacher is pursuing. I believe these three areas can provide a base of understanding which all teachers should have, regardless of what they may be teaching.

Additional background in the perceptual-motor area should be required in relation to the work which a teacher intends to do and the nature of the group or groups with whom the teacher will work; however, all of the perceptual-motor curriculum experiences offered at a university should be open to any teacher who wishes to elect for greater understanding. There are at least five areas which should be provided to permit the structuring of tailor-made professional programs which will satisfy particular work demands:

1. There should be provision for development of knowledge about and work with various types of perceptual-motor programs and assessment tools. This area

1. (continued) would include physical education programs which have been structured to emphasize perceptual-motor development for the so-called normal, programs for the slow learners, the physically handicapped, the emotionally disturbed, the retardates, the deprived. Particular attention to the promotion of ability to carry out curriculum development in relation to perceptual-motor programs for specific groups should be one of the major goals. A very realistic understanding of the limitations and strengths of the available assessment tools and current programs is essential.

2. As another area of concentration, knowledge of perception as a specific phenomenon is needed. It is probable that a number of different types of teachers would study in this area; perhaps this area should be required for all teachers.

3. For those teachers who will work in the movement area as a vocation, a thorough grounding in the nature and organization of human movement and the detailed study of the potential of man for movement are necessary. Included here are areas like physiology of exercise, kinesiology, motor learning, tests and measurements and anatomy.

4. Experience in and with a variety of movement forms and activities and movement experiences which have particular emphases, for observation, performance and analysis purposes, and understanding of the role of movement in man's life and in the culture would round out the background needed for a quite basic understanding of the field of movement.

5. In order to work effectively as teachers in the perceptual-motor area, tools for teaching are essential. The major focus for study and practical application is materials related to the nature of learning and to the promotion of opportunities for optimal learning. Areas might include programmed learning, teacher behavior, curriculum theory, behavioral objectives, evaluation, teaching approaches, technological apparatus and related learning systems, administrative principles and procedures, learning principles and philosophical positions. Not the least of the goals sought is a philosophy of teaching which is primarily humanistic in nature.

The incorporation of the perceptual-motor development area into teacher preparation programs can be done in many ways.

The most traditional approach would be to add additional

courses or to insert the needed materials into existing courses. For the preparation program which is primarily a collection of courses, this might be most appropriate.

Another appraoch might be to integrate various courses into a few core courses; to a degree, the subject orientation is retained in such an approach but a common perspective is utilized to tie areas together. This approach is frequently known as the "integration approach" to curriculum construction. The University of New York at Brockport is currently offering an academic major in physical education which seems to utilize this type of core approach. The basic core at Brockport consists of 15 hours of core courses which focus on the study of physical education--"Biological Perspective," "Psychological Perspective," "Socio-Cultural Perspective," "Philosophical Perspective," "Seminar in Core Perspective." The basic core is required. In addition, students may choose 15 hours in the core, "Sports Science." Whether perceptual-motor development is well emphasized in the cores is difficult to determine for there is not much detailed material to indicate what the exact content is currently in the various courses; however, with but little disruption, incorporation of many of the perceptual-motor development areas into the appropriate cores seems feasible.

Another approach might be to utilize the core idea but to focus upon major identifiable clusters of concepts as the basis for core courses; in addition to the development of a basic core, additional supportive cores are developed also as a general rule. An approach of this nature which has been developed at Illinois State University and initiated as a pilot program this year of 1971-72 uses a 15-hour required core of experiences which focus on the primary concept, MAN MOVES IN ENVIRONMENTS FOR PURPOSES. Key concepts have been identified and are the stimuli for work within the four core areas. This 15 hour core is considered to be the "movement discipline" core; at the present time there is also offered

(1) a core consisting of a concurrent sequence of physical activities related in terms of common elements and learning principles, and (2) a two course sequence core which focuses on the teaching-learning process and particular types of programs; this latter sequence is taken following three of the courses of the discipline core. Finally, selection of courses in cognate fields is used. This is for purposes of providing supportive knowledge or specific depth of understanding in relation to specialized fields of study, particular types of peoples and/or situations, and facilitation of learning. Throughout the cores, related and extensive field work and internship involvement are to be utilized. It would seem that the majority of the materials in the perceptual-motor area can be handled in a meaningful way within this structure. Part of the merit of this type of program planning is the potential for flexibility; a wide variety of programs can be built around the basic discipline core.

Variations of these three basic contemporary approaches to professional preparation are certainly acceptable for there is no such thing as one correct conceptual model or one correct subject-centered, course-oriented model or one integrated-approach model. Many of these approaches can be adapted to allow for a great deal of individualized learning; a systems approach would allow for such flexibility.

The last question raised initially concerned the problem of how teachers should learn about the perceptual-motor area. It seems logical to say that in relation to the quality of learning desired in the perceptual-motor area, the goal is the same as for any other area of the curriculum--the goal is "optimal learning." In formulating the kinds of learning conditions needed and the learning approaches to use in teacher preparation programs, an open and inventive mind coupled with the practice of hard assessment of the merits of various ideas are fundamental. As I frequently tell my students, all and any ideas about facilitation of learning should be considered initially unless it is obvious that they (1) lead to subversive activity; (2) promote immoral or amoral behavior; (3) affect detrimentally the welfare and safety of students;

or (4) are in conflict with philosophical beliefs and/or operational procedures practiced by the institution in which one is employed. In general, however, one could state that methods of teaching which promote the structuring and interrelating of knowledges, skills, and appreciations are desirable; this concept is based on Bruner's proposal that to know is to understand structure (2, pp. 17-32).

The utilization of actual true-life situations in agencies and community institutions, for field experiences and internships and micro teaching and team teaching, is a most necessary aspect for learning in the perceptual-motor area; the "real world" must be experienced through guided observations and actual coping action if teachers are to set realistic goals and develop realisitic modes of behavior.

There must also be some provision for open discussion and debate and individual probing in relation to observations, field trips, areas of study and other types of experiences; a seminar type class which is flexible as to nature, place and method of interaction serves this purpose well.

While it may already be obvious from prior remarks that the curriculum dealing with the perceptual-motor area must be interdisciplinary in nature, this approach for learning is so essential that it should be mentioned again; the plain fact is that no one discipline can provide an optimal level in all the experiences and knowledges needed.

Procedures for individualizing learning should be employed to the highest degree possible. A movement behavior laboratory for the study of movement would be helpful. The multi-media instructional approach is also most worthy; it is characterized by such things as a "systems" organization, audio-tutorial learning, seminars, small discussion groups, extensive reading, programmed learning, contracting, goal setting with behavioral objectives, modular scheduling, mini courses, and use of computers in promoting learning. Essential to this approach and to the concept of individualizing learning is the provision of an independent study center equipped with tape recorders and tapes, 8 mm automatic projectors and cartridges, models

for anatomy, kinesiology and physiology and other basic areas, periodic indexes and reference and reserve books, microcard readers and a microcard library, copies of outstanding articles, an overhead projector and transparencies, tape decks and tapes and closed-circuit TV.

In conclusion let me add just two comments. There has been no attempt in this presentation to differentiate as to what specifically goes into an undergraduate program or into a graduate program. It would seem that all of the concepts and guidelines and principles presented could and should be used in structuring specific undergraduate and graduate programs. Of course, at the graduate level there would be more specialization along with considerable work in supportive fields. Secondly, while content and organizational and technological devices assist in the promotion of optimal learning, the attitude of the teacher may be, and frequently is, the factor which determines both the quality of and the degree to which persons learn. The humanistic teacher who has a zest for life and has faced himself squarely and believes that all people are important and are capable of learning may be the yeast that sets the mix a-bubbling.

The words of Galileo are indeed true, I think--"You cannot teach a man anything; you can only help him find it within himself."

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PERCEPTUAL-MOTOR DEVELOPMENT IN THE PROGRAMS OF TEACHER PREPARATION

by

Dr. Hubert A. Hoffman
Physical Education Teacher Preparation
University of South Florida

Whenever you consider the professional preparation of teachers, you always ask the question, "What do teachers need to be prepared to do?" Examination of programs in teacher preparation makes it hard to really know.

There are three basic patterns of professional preparation for physical education teachers. Each is designed to meet specific certification requirements. These patterns are programs leading to certification for secondary school teaching, K-12 or K-14, or elementary school teaching. The K-12 pattern is the most common, but one must look cautiously at these programs. While many are truly K-12, others are secondary programs with an option to take one elementary physical education course and one-half of the students teaching at the elementary level to extend certification from grades 7-12 to K-12.

A recent survey on professional preparation of elementary physical education specialists conducted by the Elementary School Physical Education Commission, Physical Education Division, AAHPER, collected some data concerned with perceptual-motor development. The following questions were asked:

> If you have one general course in elementary school physical education, how well prepared are your students to work productively with children in these activities?

The responses to perceptual-motor activities were:

3% indicated (1) extremely well prepared
36% " " " " (2) adequately prepared
44% " " " " (3) poorly prepared
16% " " " " (4) not prepared

The average response was 2.8. This was the highest average response (lower averages indicate better preparation) except for Aquatics. Average responses ranged from 1.6 for Games and Sports to 3.3 for Aquatics.

Unfortunately, this one course approach is still all that most physical education majors have in their professional preparation. Of these, 60% are either poorly or not prepared to work productively with children in perceptual-motor activities.

In another question, an attempt was made to determine in what courses the study of perceptual-motor activities for children was conducted. Persons answered the question only if they did not have one general elementary school physical education course. The results were that 23% indicated that perceptual-motor activities were studied in a separate elementary course; 33% indicated this study in a K-12 course; 67% in a general teacher education course; 29% said it was not offered; and 9% indicated some other arrangement. At this time it is a little disturbing to see that 29% of those institutions preparing elementary specialists that have more than one general elementary physical education course do not require study in perceptual-motor activities.

The graduate study picture showed that 40% of the institutions offering graduate study had courses in perceptual-motor activities. The results from this survey indicate that much more needs to be done in the professional preparation of teachers.

During this Conference, the question was asked, "Is there anything new in perceptual-motor development?" Dr. Cohen and other speakers have indicated that there is. We are learning more about perceptual-motor development or maybe even perceptual-motor cognitive development. This was indicated in the discussion of the "physiology of cognition."

Other persons say no, we've had perceptual-motor programs for the last 100 years in good physical education programs. If this is true, perhaps we need only change the names of our present courses and activities. I agree that "good" elementary programs are indeed perceptual-motor programs. However, in the past, we have classified activities without regard to the needs of developing children.

To illustrate that we haven't completely understood perceptual-motor development let me point out two cases. In many public schools we now see yearly plans that show units in games, rhythms, self-testing activities, movement education, and perceptual-motor activities. In teacher preparation we have added a course in perceptual-motor development.

At the University of South Florida, physical education majors have an experience called Human Kinetics. This experience involves studying the moving, developing person from birth on. This study takes place in a usual classroom setting and in a movement laboratory. In the laboratory, students look at the demands made on students in any movement situation. This results in students being able to see the relationship between perceptual-motor development and movement education. Dr. Louis Bowers shows this graphically using a movement education outline presented in Basic Movement Education for Children: Rationale and Teaching Units by Bonnie Cherp Gilliom, Addison-Wesley Publishing Company, 1970. SEE FIGURE I.

When students understand this relationship, they become more sensitive to the developing needs of children and understand how to use their knowledge of perception and motor learning in creating a productive learning environment for their students.

I also want to refer you to the article in the April 1970, JOHPER by Dr. Hope Smith. In this article, "Implications for Movement Education Experiences Drawn from Perceptual-Motor Research," Dr. Smith reviews some child development facts and suggests some implications for teaching.

The examples of Dr. Bowers and Dr. Smith serve to emphasize that perceptual-motor development should not be studied in isolation in the professional preparation of teachers. This might also be viewed as the minimum amount of study for all physical educators. Obviously, a student who wants to work more with children with various disabilities should have more course work in Special Education, special study in specific tests for diagnosis and remediation, and practical field experiences with children with learning problems.

One last thought before I close. On the first day there seemed to me to be some emphasis on the interrelated processes of perception, cognition, and motor activity. We then began to hear about interdisciplinary teams working with children. I was very pleased to hear the term "slowly developing child" which indicated to me a sensitive philosophy. I also hear people talking about how children feel, how they behave, and how teachers affect their behavior. In teacher preparation, we must consider all these aspects in an integrated way. Perhaps programs in the professional preparation of teachers need to become interdisciplinary. Maybe we could start with our own physical education faculty and then move out to the rest of the University faculty who share our concerns about children.

FIGURE I.

THE RELATIONSHIP OF PERCEPTUAL-MOTOR DEVELOPMENT TO MOVEMENT EDUCATION

1. Awareness of Body Parts
   - Body Parts
     - Head
     - Neck
     - Shoulders
     - Chest
     - Waist, etc.
   - Body Surfaces
     - Front
     - Back
     - Sides

2. Direction of Movement of Body Parts
   - Neck, trunk, upper then lower extremities from proximal to distal portions.
   - Body Relationships
     - Body Shapes
       - Straight and Narrow
       - Straight and Wide
       - Twisted
     - Body Part to Body Part
       - Curled
       - Stretched
       - Twisted
     - Relationship of Body Parts to Objects: on, off, over, around, across, under, near to, far from.
     - Relationship of One Person to Another: near to, far from, meeting, parting, facing, side by side, shadowing, mirroring, following.

3. Body Transport Skills:
   - By Transfer of Weight
     - Steplike action
     - Rocking
     - Rolling
     - Sliding
     - Flight
   - Crawling
   - Creeping
   - Walking
   - Running
   - Side Steps
   - Leaping
   - Jumping
   - Hopping

4. Static and Dynamic Balance
   - By Balancing (Active, stillness)
     - Balancing weight on different body parts
     - Balancing on different number of parts

5. Direction of Movement of Total Body
   - Divisions of Space
     - Self space
     - General space
   - Dimensions of Space
     - Directions: Forward, backward, to one side, to the other side, up, down.
     - Levels: high, medium, small
     - Planes-Pathways: straight, curved, zigzag

6. Eye-Hand-Foot Coordination.
   - Manipulating Objects With Body Parts
     - Balls: bouncing, catching, tossing, pushing, kicking, trapping

INNOVATION OF PHYSICAL EDUCATION & RECREATION IN A SPECIAL EDUCATION SETTING

by
Warren Aaronson
Bureau of Education for the Handicapped
U.S. Office of Education

There are many real problems in studying innovation as it relates to program design, development and dissemination of projects for the handicapped. First of all though, knowledge may be virtuous, being innovative may not! Also, it is a paradox for people to be selected on credentials related directly to academic ability while the perseverance of the innovator is considered only secondary. Education more so than ever before is in need of this type of perseverance. Thirdly, recreation is an area where being innovative can bloom beyond others since it is easily equated with enjoyment pleasure and naturally fulfillment. In light of this, a number of innovative projects which are recreation oriented are worth briefly mentioning. Many of them funded originally under Title III, some of them were joint funded with other title programs, such as Title I 89-313. Title III, ESEA, is a Federally funded program which fundamentally addresses itself to innovative and exemplary endeavors on the part of local communities. Title I, 89-313, for the handicapped, has jointly funded with Title III, programs in state and privately supported institutions for exceptional children.

Although relative fundamentally to the geographical area in which they reside all of these programs nevertheless address themselves in some way to building broken lives. Many of the lives were broken not only in terms of the initial diagnosis and perpetuating environmental syndrome or factors which helped to make the diagnosis come true. But many were also "broken" by the lack of innovative and creative concern which they not only desperately needed but deserved. "Innovation" in recreation was not a bandaid but an answer to this problem; it can also be a synonym for humanism.

A number of these programs discussed below focus upon the role of the physical education and recreation specialist. These professionals striving to innovatively put together difficult parts in different ways have more than once risked being eliminated from traditional and conservative social systems. In captioning their story one reveals only the part of the iceburg that shows.

PHYSICAL EDUCATION AND RECREATION ORIENTED PROJECTS

In Alamose, Colorado, a cooperative summer school camp was developed in which more than ten individual camps were operated during the summer months. Along with a camp for the diagnosis of learning handicapped youngsters, a camp for the physically handicapped was designed. Here specialists worked in helping the physically handicapped to find for the first time, that a camp during the summer months, or perhaps at any other time, may not be merely and/or only for the "normal" child.

The integration of the handicapped in a slow but sure manner into regular or normal activities, as best they were able to contribute or participate, eventually took place. The child centered affirmation of the human being not only centered around the structuring of his wounded ego, but structuring a personally related physical education and recreation curriculum and activity schedule for each and every child. This curriculum initially had to do with running, jumping, hopping, and psycho-motor activities. In time the children in the program moved from "with-in" as well as "without!"

In Westville, Indiana, the Norman Beatty Hospital School has worked on a program for improving total self awareness. This program was designed to increase self awareness of handicapped children and to accelerate the child's readjustment to a normal school program.

All of the children in the program were residents of the State Hospital School. The expansion of the school program was considered innovative because it addressed itself to

(1) a sox education program, (2) a social skill development program, through field trip experiences, and (3) a gymnastic program. Physical education and recreation specialists were brought in as members of a staffing team which looked at the "total" child and amplified and magnified the child's undeveloped and/or unrecognized and personality needs. The overlapping of physical education, recreation and special education became a new vehicle for developing understanding, and determining a newly designed curriculum.

At the Austin State School in Austin, Texas, an expansive physical education and recreation program was creatively and concretely developed. One of the major program concerns was with functional concepts in physical education for both the severelyand mildly retarded. A great deal of initial systematic research was conducted to determine the appropriate curriculum content, equipment, and proper facilities most conducive to determine the optimal psycho-motor development of over fifteen hundred retarded children who were six years of age and older. A comprehensive physical education program was then developed directed toward (1) program services and (2) extensive staff training. Children participated in the physical education program(s) by helping to literally build the new recreation facilities. They created a baseball field, a track area, and a new camp site. Staff members from a variety of employment levels within the institution learned for the first time through direct participation what physical education and recreation actually meant. Many of the children and staff learned this for the first time together.

The "total" child has been a concern of educators for quite sometime. Yet, this concern, as it addresses itself to physical education and recreation programs, has only been actualized in recent years in terms of developing programs, innovative or otherwise, for the handicapped child. The totality of the educational system has historically both neglected and rejected these areas! However, innovators in this discipline, i.e., special education, should have directed themselves to this problem long before now.

In Houston, Texas, a model education demonstration center for the mentally physically handicapped child was developed. The children served by this demonstration center were offered counseling and guidance. A newly developed curriculum program was also provided. Facilities for maximum physical and recreational development was instituted. In doing so, it was hoped that children and their families would be brought closer together, improve family interrelationships, as well as the relationship of the handicapped child with himself. Inservice training for special education personnel and observation facilities for training education students was provided.

In Bedford, Massachusetts, a Title III program for Identification and Integrated Instruction was developed. A multi-disciplinary diagnostic center was established to coordinate school activities with a number of specialists from a variety of disciplines. Physical education and recreation instructors, speech therapists and classroom teachers spent part of each day working with the children. Also, included in the staffing were physicians, social workers and psychologists. The physical education and recreation specialists learned to understand not only their own roles, but the roles of other disciplines as well. The question of the best place for physical education and recreation for the retarded, in terms of the educational hierarchy was investigated.

This same inter-disciplinary team approach, but in the area of special services, has been developed in the Saint John's Public Schools in Saint John's, Michigan. The team of specialists, were composed of counselors, social workers, special educators and physical education and recreation personnel. These people addressed themselves to the "total" child working with a team of recreation specialists. After diagnosing the child, an innovative remedial program was designed and developed, personalizing the role of the youngster.

One of the highlights of a 1969 Conference on Innovation in Special Education in America, held by the Bureau of Education

for the Handicapped, in Washington, D.C., was the presentation of a Rochester, New York, program.

This was a comprehensive physical education program for the severely physically handicapped. It initially consisted of nearly fifty pupils. The major objective was to find a way in which physical education could be adapted to more adequately meet and answer the specific special needs of each child. A secondary objective, was to induce other schools in other districts to incorporate similar programs with similar philosophies.

Since the program first began the number of students enrolled in it has tripled. The school districts now recognize the dire need to provide special facilities and activities for the physically handicapped child. They have remodeled many rooms and expanded their staff not only at the quantity but quality level of operation. Volunteers are active in the efforts to provide a meaningful program and support staff in offering a number of workshops to train other personnel.

DISCUSSION:

The above programs all have several common denominators. First of all, they are child centered; they deal with people, i.e., reality more than rhetoric. Secondly, these programs all strive and struggle to be "innovative." They also mirror the fact that the price one pays in the developmental creative process is more than a financial one indeed; for innovation is expensive in many ways! Thirdly, these programs have proven, and are continuing to prove, that innovation in the area of physical education and recreation for the handicapped is still a relatively new area of concern. It is one in which we have few guidelines as to where definitive, cognitive knowledge in "innovation" begins and traditionalism and conservatism ends.

With this in mind, one should strive to provide an adequate physical education program which easily adapts itself to the limitations and/or the ability of a youngster and not to the limitations of an organization or a specific situation.

It seems sad that one's efforts to help handicapped children take their place in the real world does not also take into consideration the specific efforts of the innovator in implementing and adapting himself and/or his program(s) to this strategic meaningful goal. Somehow, the notion that cause is disrelated and not connected with effect becomes unfortunately more apparent when one does not see the relationship of the innovator and the forces of the social system or culture in which he functions.

The confusion which confronts the sensitive eye frequently makes the quest for creativity a crusade of sorts. The innovator is always a sensitive investigator, quasi-crusader!

What we know in terms of the dilemma (for lack of a better word) of the innovator, is that educating the administration may be as difficult and as important as the innovation in physical education and recreation itself. The innovator must straddle both of the complex areas of educating and building at the same time.

In the final analysis, the education of the public towards recognizing the need for appropriate and innovative physical education and recreation programs may still be too expensive a question to directly and deliberately ask. However, not asking it may eventually prove to be more expensive. Time reflects our losses and bills us also.

DIAGNOSIS OF PERCEPTUAL-MOTOR DISABILITIES

Dr. Jeralyn Plack
Women's Department of Physical Education
Michigan State University

Collectively we are faced with the questions of should we be testing and which instruments and techniques should we be using? These are the two questions which I wish to direct my remarks toward this morning.

With respect to the question should we test, I think we need to answer the question of purpose for testing. Diagnosis and evaluation achieve full significance only when they are viewed as preceding some positive curriculum action. Based on evaluation and diagnosis evidence we should be able to prescribe activities that will effectively eliminate,or at the very least, alleviate perceptual-motor problems. Consequently, it becomes imperative to consider diagnosis in view of the possible curriculum changes it could precipitate.

In search of answers to these questions I would like to briefly review three well-known compensatory programs that are currently being employed in the United States. I'm sure that most of you are familiar with all of them so I won't go into any great detail about any of them, but will briefly comment about each.

The most controversial of these is the Doman-Delacato Program which bases their activities on a concept of neurological reorganization. According to their theory a part or parts of the brain are normally non-functioning. They suggest that the way to remediate brain deficiencies due to heredity factors, some kind of brain injury, or inadequate development is neural stimulation through motor activity. These activities follow a pattern that represents man's ontogenetic development and the activities may be either passive or active depending upon the diagnosis of the particular stage of the child's development. Their ultimate goal is to develop neurological organization which culminates in an established cerebral dominance. There has not been sufficient experimental research to support or deny Doman and Delacato's position. What has been done suggests that their program is not effective. The medical profession, specifically, the American Academy of Neurology and the American Academy of Pediatrics, have gone on record as indicating that as of yet, there is no firm evidence to substantiate the claims of this program.

A second popular program is that proposed by Frostig. She says that reading is a function of discrete visual-perceptual skills and her program is directed to the development of such skills. Also incorporated into the Frostig programs are many gross motor activities. Again we find that a search of the literature does not offer conclusive evidence that engaging in the Frostig program does effectively remediate reading disabilities.

A third one, developed by Kephart, places a major emphasis on motor activity. Kephart has stated that "movement is the basis of all learning." He identifies 8 stages of perceptual-motor development that children are believed to go through, sees these stages as being hierarchial and suggests that failure to complete one stage will predispose the child to subsequent perceptual-motor disability. Remedial efforts are designed to bring the child back through the appropriate developmental stages. Again we are faced with the same problem that we have no substantial evidence that the Kephart program is effective. When I speak about support evidence, I refer to rigorous research that meets the standards that research design experts would accept. Thus I am not including clinical reports.

Now I would like to acquaint you with the dissertation which I recently conducted. I administered the Kephart Perceptual-Motor Survey to determine whether or not it would predict achievement in either academic skills or motor skills. I used as a sample 120 fourth grade children to whom I personally administered the Perceptual-Motor Survey. I also administered 4 selected motor tasks that would be typical of physical education kinds of experiences. I was also able to get data on the children's academic performance based on the Stanford achievement test. I treated the data for language skills including capitalization and punctuation, grammar, spelling, modern math, and two different reading tests. The statistics analysis used were regression equations which enabled me to determine whether or not the Purdue Perceptual-Motor Survey predicted any of these variables. The results were very interesting because they fell into patterns. Academic performance was predicted reasonably well particularly when correlated with the perceptual-motor match portion of the Perceptual-Motor Survey. So, based on this relationship, I would be willing to say that if you are interested in using this attack you could save yourself a lot of time by using just that portion of the test.

The motor skills,on the other hand, were predicted by balance and body image, but not by the other variables on the survey. I don't intend to publish this study because after I had collected all of the data and completed the statistics on the achievement levels, I discovered that even though these children were in 4th grade their mean achievement level was on a 3rd grade - second month level. Which means that I have a bias sample and consequently because I do, I would project that the perceptual-motor survey is functioning more effectively than it would with a more normalized sample. So I intend to look at this again but I'll correct my original error and make sure that I get normal samples at the outset. I would say, however, that the Purdue Perceptual-Motor Survey does not predict either academic or motor skills as a battery. Now, in defense of Kephart, I would like to point out that he never did claim that it did. He intended that the instrument should be used as a gross screening device and not as a diagnostic tool. It may function for screening purposes but it does not function as a diagnostic instrument.

Now let me summarize just briefly the first portion of this presentation. We've seen that there are at least three theories: three approaches which profess to provide the underlying rationale for the remediation of learning disabilities. The evidence at this time strongly suggests that these theories are not accomplishing what they propose to accomplish. Now I do not think this should come as any great surprise considering what these theorists are attempting to do. They seek to identify a general factor, in this case perceptual-motor development, which underlies the learning process. This same purpose directed the efforts of those who studied intelligence and after 70 years of research we still cannot state unequivocally that the intelligence quotient is a general trait that will predict and direct learning. The best coefficients of correlation that we get between intelligence quotient and learning are in the magnitude of .50 which means that intelligence can account for approximately 25% or the variance. To suggest that perceptual-motor learning will be as effective, it's still too early to say. As physical educators I think of interest also is the research that has dealt with the motor domain of human behavior and we see immediately that similar hazards have confronted the efforts of those who wish to identify a generalized motor ability. In fact the work of Franklin Henry strongly

suggested that motor ability must be viewed in the plural, that human beings in fact have a variety of motor abilities and that no one factor emerges as a general predictor. So it seems to me at this time we must conclude that learning is a complex process which emanates from the interaction of a multiplicity of variables. To suggest that intelligence or motor ability or perceptual-motor skills form the one underlying, directive variable is a little bit hazardous. I believe we are in trouble if we are going to say that perceptual-motor learning forms the foundation for the remediation of learning disabilities. I would speak strongly to the point, that we must focus on what the contribution of physical education must be. I believe that we have one and I believe motor performance is a critical element in the education of the child, but, I also believe that it's only one element. The purpose and direction of physical education should be to help young children develop efficient movement patterns. Now, from that kind of a philosophy, it then becomes possible to consider the second question and ask ourselves how this is to be accomplished. At Michigan State we get referrals daily of children from the Mental Health Services, from Psychological Testing Services, from the local hospitals, from the public schools and from parents themselves. We have a wide source of input for referrals and these people are all seeking help with youngsters who are having motor problems. We have established a task force to develop policies concerning these referrals. It's my interest and function on that task force to come up with some kind of a screening and diagnostic instrument that will give direction to prevailing activities for these youngsters. At this time in our early stages we do not have a battery test that will do that. I wish I could provide you with one; I'm sure it would make me the most popular person at this conference. But I can share with you the underlying rationale that I am pursuing. First of all, I would reiterate that I'm operating from a premise that efficient movement is a valuable tool in and of itself. That our youngsters deserve the opportunity to learn to move, not because it's going to enhance their cognitive development, although it may, but simply because it will enrich their lives. I see this as giving direction to evaluation because then the first half is to evaluate efficiency of movement and try to determine where these youngsters are in that respect. My approach to that would be to try to keep this in the perspective of

physical education as a profession. That means to look at what we can offer children from kindergarten to grade 12. I know the concentration of this conference and much of the discussion here has directed itself to pre-school education and primary grades. I certainly think that is important because that is where the fundamental patterns are developed. I think we need to look at the whole range of activities and when we do I think we see that fundamental to all the complex skills that are introduced at later times are locomotor patterns and basic skills. This is where I would begin with any evaluation. In order to evaluate these two broad classes I think we need to view performance as falling into an identified stage of development. I have explored more standardized tests in the past concerned with throwing and catching at a target in trying to get some objective measure. I'm not going to pursue that further as I have come to the place where I think we should try to identify the stage of the movement pattern that the child is in. There is a book by Lea and Febiger published in 1970, by Wickstrom entitled "Fundamental Motor Patterns," in which pictures and written analyses of motor patterns stages are presented. We are also fortunate at Michigan State to have Dr. Vern Seefeldt, who is interested in the development of motor patterns. He is doing some independent work with the aid of motion picture film that attempts to identify the stages of motor development that children go through. Our efforts will be to watch the child perform various locomotor patterns and identify a stage of development by ages. So we can say he is in the stage that a 3 year old or a 4 year old would typically be in. Now if we get to the place where we can do that and then subsequently look at his chronological age, we can then determine a maturational age. Dr. Seefeldt tells me that this type of quotient is a little bit sophisticated as chronological age is not necessarily a good predictor of maturational age as the child may vary two years in either direction. So if his chronological age is ten he could have a maturational age of eight to twelve. Then when we state that a ten year old has innovative patterns it may be that he is maturationally immature and that is the stage of development we ought to be expecting. Now the problem with evaluating the maturational age is that is seems at this time that the best predictor is bone growth. This requires x-rays of the wrist and this is the type data that Dr. Seefeldt pursues. Thus we would be somewhat limited to

chronological age and if we take that as a gross indication then we can make a rather general judgement of whether or not the child does demonstrate the pattern that would be expected for that age level. Now if we were to assume that he doesn't, the next problem would be to try and determine why not. I think what we need to do is to try to identify what we see to be the components of efficient movement. We have had the opportunity over the last couple of days to share the thinking of some other people in this regard and it may not have struck you that way but I think the information was there. Repeatedly as we listen to people with some expertise, and read in this area, we will discover that the same components appear over and over. We find such components as body image, space, directionality, rhythm, coordination, balance, and I would add to that physical fitness. I define fitness as being basically a question of strength, endurance, and flexibility. Given those kinds of elements the next task is to design instruments which will accurately measure each component. The instruments that we ultimately design will collectively form the battery that would be used for diagnosis.

Without going into a lot of detail about each one I would like to suggest the direction we will pursue with respect to one of these components. Using body image as an example, when we attempt to measure this component we really are asking ourselves how does the child perceive himself? What does he thrill about himself? Consciously or unconsciously and how do these responses direct his response to the environment? I see that as being two separate questions we can evaluate by looking at the child's responses. I think Kephart's identification of body parts might be of some use here as is his obstacle course test or a comparable one. I really could find stronger support for a more complex type obstacle course that makes demands on the child's judgements on himself as it relates to equipment and that kind of thing. Beyond this we have several basic considerations such as in the instance of identification of body parts or an obstacle course which must be arranged to give us objective data and some number - a score that we can look at. But there is more to it than that and I would give some consideration to using some of Piaget's techniques. Even though Piaget's techniques have been criticized, none the less, I think he has some very thought provoking techniques of which we ought to be taking advantage. I propose that we are going to develop a set of slides or pictures that will subsequently be shown

to the children and ask each to identify which child looks most like him at this moment. I have not decided how many pictures then should be shown, however, I believe it is between three and five. I suspect I'll probably go with three but the pictures will direct themselves to being similar except for one variation. The first one might direct itself to height and there would be three youngsters of different heights. The second one could direct itself to weight and there should be something much more subtle so that I would suggest that we might consider sharing pictures of children engaged in a movement task that clearly demonstrates degrees of success. This could be done by showing a picture of a child throwing a ball at a target. In one picture the ball could be hitting the target and in another one it could be way off and in still another one it could be close. Another set of pictures would be showing children engaged in various activities and ask the child to choose an activity in which he would like to participate. Now the important thing about this is, throughout the course this technique the test administrator should be engaged in conversation with the child asking him why a given child looks most like you. Now of course the obvious problem with this is some one will ask what kind of data will you get. How will you ever feed that type of data into a computer and the answer is you wouldn't do that. That kind of information would be so contaminated with artifacts of design that you could not isolate information and say that this is the way it is or that this is true. This means for the time being we will not be in a position to publish facts and figures and try to set quartiles and percentile ranks or to make predictions. I do believe, however, that this kind of approach will provide us with an understanding of a given child. Once we have achieved that understanding we ought to be able to get some kind of communication and once we have communication I think we are on the road to opening the door to learning.

RESEARCH FINDINGS REGARDING PERCEPTUAL-MOTOR DEVELOPMENT AND ACADEMIC PERFORMANCE

Stephen E. Klesius
University of South Florida
Professional P.E. Dept.
Tampa, Fla. 33618

In planning this presentation an approach was sought which would review and summarize research literature in a manner meaningful to teachers rather than just the researcher. Too many meetings, at too many conferences or scholarly meetings devoted to research, end with the majority of conferee's going away saying "What in the world were they talking about" or "So what." Hopefully this presentation will be of a practical nature, one which reviews research and indicates implications for programs of physical education. In order to do this, the presentation will include: critiques of independent reviews of research literature, statements by critics of perceptual-motor development, synthesis of research findings, and comments and observations.

Independent Reviews

The first of the reviews to be presented, in alphabetical order, was completed by Balow (1) who included 12 studies and failed to find any research evidence supporting the value of perceptual-motor programs. It was stated that such activities are neither a cure-all for general learning disabilities nor specific to any basic school skills. Nevertheless, Balow supported the use of perceptual-motor experiences in the curriculum on the basis that the activities "will probably help teach children important general behavioral skills necessary for success in school, but clearly not replacements for the careful diagnosis and direct teaching of basic school skills." The following six reasons were given for including perceptual-motor development activities within the curriculum:

1. The enjoyment and developmental appropriateness of motor activity, particularly for primary school boys for whom sitting still is so inappropriate developmentally.
2. The personal recognition of success that can attend motor-perceptual activities, particularly for pupils long used to failure in school.
3. The accompanying positive attention from significant adults.

4. The fact of teaching,in direct drill form, a set of visual and motor skills that may be weak, or absent, and which relate to school demands but ordinarily are left to develop incidentally.
5. Teaching, via such visual and motor activities, habits and skills of attention. . .
6. Teaching, via such visual and motor activities, habits and skills of following directions . . .

Cratty (2) has been deeply involved in the analysis and description of perceptual-motor abilities and learning. One of this writer's many publications included a review of perceptual-motor research in Perceptual-Motor Efficiency in Children. Selected statements from this publication are as follows:

1) "Programs of perceptual-motor education are likely to elicit change in those attributes trained for. Attributes such as: balance, left-right discrimination of body parts. hand-eye coordination, agility, and sport skills will change in varying degrees in children with moderate to mild deficits. More change is more likely to occur in children with mild deficits than those with more pronounced problems and in younger than in older children."

2) Not all children need be placed in a perceptual-motor program. Children who have been identified as having perceptual-motor deficits should be placed in remedial programs as soon as possible.

3) Improved motor skill proficiency and increased physical fitness may increase academic performance of some students experiencing learning problems. This would probably be due to enhanced self-concept rather than other factors.

4) Visual training may aid students who have been identified as having visual problems when the activity program is designed to remediate these specific deficits.

5) Structured patterns of movement which involve creeping and crawling are questionable except in cases of severe motoric inability.

6) Active game experiences which involve problem solving and body movement have been shown to be a motivating and effective way to teach and reinforce some classroom concepts and operations. Serial memory activities in letter and number problems, verbal and arithmetic games and form recognition experiences have been used to enhance the educational development of typical and atypical school students.

Glass and Robbins (3) reviewed fifteen studies of the effect of therapy to improve neurological organization as defined and prescribed by Delacato. Half of the studies were deemed inadequate in experimental or statistical design. The other half contained biased designs and contamination via special treatment effects to characterize the results as being highly questionable. These authors concluded their review of research by stating that each of the empirical studies which Delacato cited as 'scientific appraisal' are of dubious value in lending support to the theory of neurological organization.

Klesius (4,5) completed two reviews of literature; the first in March, 1970, and the second April, 1971. The 1970 paper reviewed twenty-eight studies wherein a variety of perceptual-motor programs were employed. All research found in the search of literature were reported despite possible criticisms of many investigations. The reviews' focus was upon the effect of perceptual-motor activity programs on the reading achievement of students with average or above average intellectual ability. Twelve studies found statistically significant differences in reading readiness or achievement for subjects receiving perceptual-motor experiences but sixteen studies found no differences between experimental and control groups. The general conclusions of the review were:

1. The effectiveness of perceptual-motor development programs in improving reading ability can neither be confirmed nor denied.

2. In general, perceptual-motor development programs employing a wide variety of experiences appear to show promise with underachieving intermediate grade students and pre-school children. The effectiveness of the Delacato and Frostig (prior to 1970) type programs when used independently of other perceptual-motor activities, is doubtful.

In response to the question "would the results of this review have been different if only research of high quality was included" Klesius prepared a second review. In order to differentiate the quality of experimental investigations criteria defining acceptability limits were established. A total of forty studies were rated according to the criteria and twelve met or exceeded the standard for inclusion.

Six of the studies supported the hypothesis that perceptual-motor development programs significantly influence reading readiness of childrenin kindergarten or the reading ability of students from a low socio-economic environment. Likewise, six studies found no difference in reading readiness or achievement following a program of perceptual-motor activities. Two of these studies found significant improvement in perceptual-motor ability but no concomitant increase in reading achievement was reported. This is contrary to claims made by the proponents of perceptual-motor programs. The conclusion drawn was: "the hypothesis that perceptual-motor development programs positively influence reading achievement can neither be confirmed nor denied on the basis of the research reviewed."

The 1970 International Reading Association Convention included a session devoted to the subject "Perceptual Training - Does It Result in Reading Improvement?" Robinson (6) made the following statements regarding a review of literature concerning perceptual training following the Frostig, Kephart, and Winter Haven approaches: "The Frostig program of visual perceptual training has not been effective in improving reading. . ." and in general, the studies of the effects of visual-perceptual training lead to no clear-cut conclusions. Such training may result in improvement on tests of visual perception but seldom is a substantial improvement in reading found. Duncan (7) in drawing implications from Robinson's review, made the recommendation that despite the inconclusive and ill-defined nature of perceptual motor development research, teachers should support good motor development programs even though direct correlation to reading is not evident.

Seefeldt (8) is in the process of completing what will be the most extensive examination of the influence of perceptual-motor experiences upon children. This effort on behalf of the American Association for Health, Physical Education, and Recreation and the Perceptual-Motor Task Force will be a forthcoming National Education Association publication in the What Research Tells the Teacher series.

Seefeldt's preliminary conclusions, based on the literature reviewed, as of October, 1972, were the testimony and practice surpasses the research evidence to support or refute them. Criticism was directed to the ill conceived research design of studies in this area. Program bias in favor of the experimental group or insufficient number of subjects, length of time, or evaluation instruments were

major faults detected. Transfer seems to occur only when gross motor activities are very similar to academic tasks. On a positive note, Seefeldt stated that gross motor activities for the young child appear to be an excellent medium to introduce social and cognitive learnings.

Perceptual-Motor Critics

What are some comments of the critics of perceptual-motor training? The thoughts of a reading educator, opthalmologist, and special educator are presented.

Cohen (9) has completed several studies investigating the influence of the Frostig program on reading achievement. He stated, ". . . I would play the visual perceptual game if I were in the visual perception or the IQ business. But in the reading field, the surest way to get urban ghetto kids to read is to teach them letters and words and to do it thoroughly."

Benton (10) as spokesman for a group of opthalmologists assembled at an international institute on dyslexia published an article outlining the group's position. Two of these statements were as follows:

1. "Not enough objective scientific evidence yet exists to prove that perceptual-motor training of the visual system can significantly influence reading disability."

2. "The belief that eye dominance can be at the root of so profound and broad a human problem as reading and learning disability is both naive and simplistic and unsupported by scientific data."

Mann (11) has stated that perceptual-motor training is an educational fad. This view is based on the belief that the perceptual-motor difficulties of handicapped children are misread and "unwarranted extrapolations from theory." Mann stated that what is of value in perceptual-motor programs can be achieved through traditional adapted programs whether it is a "good" physical education, special education, or classroom program.

Synthesis of Research Findings

The following statements are based on the eight reviews of the research literature dealing with the influence of perceptual-motor activities upon reading or academic achievement in general.

The conclusions of each of these reviews were given and this composite may point to future directions in perceptual-motor development research and programs.

1. The quality of research is sorely lacking. The studies with faults, far outnumber those of any quality. Closer control of special effects, longitudinal designs, selection and number of subjects, and appropriate analysis require more attention.
2. The nature of assessment-evaluation instruments are not refined to the extent of unquestionable measurement. This is especially true in the realm of perceptual-motor evaluation items.
3. The contradictory and inconclusive results of the research reviewed does not allow a clear conclusion to be drawn to either confirm or deny the effectiveness of perceptual-motor programs in contributing to academic achievement, especially reading. At this point one could choose to state that because perceptual-motor development programs do not have strong evidence supporting them they should not be used or until research clearly refutes perceptual-motor development activities they should continue to be used.
4. Wide range activity approaches to perceptual-motor development programs show promise in producing positive results in this area. In physical education perceptual-motor activities involving body awareness, balance, locomotor, and manipulative skills and within the classroom visual discrimination, auditory discrimination, and language symbol skills should be presented within a sequence which follows a developmental progression.
5. Perceptual-motor development activities that more closely resemble classroom tasks are more likely to transfer and influence classroom performance. Introduction and/or reinforcement of classroom concepts and operations seem to be enhanced through an active learning game approach.
6. Perceptual-motor development activities may be a positive influence in developing selective attention, impulse control, and/or self-concept. These factors may be influenced

as much by the development of positive inter-personal relationships as by the movement experiences per se.

7. Perceptual-motor development activities are probably more effective when used with younger rather than older children and with early childhood and primary grade students than with intermediate grade students.

Comments

At this point it is easy to be a skeptic, it is rather a safe way out. On the otherhand, to go too far in the other direction without evidence is risking the credibility of your profession. Scholarly effort both empirical and rational needs to continue to shape the direction of perceptual-motor activities in enhancing the total development of the child.

Perceptual-motor activities are developmentally appropriate for programs of early childhood education and children in primary grade programs who are experiencing specific learning problems. Perceptual-motor activities should be considered not as a substitute but a supplement to programs of instruction, especially reading. While no one best method exists to teach all individuals in a class a best way exists to teach each individual. Perceptual-motor activities in a developmentally sequenced approach should exert a stronger influence on child development than the prevailing free play or game oriented approach followed in most kindergarten and primary grade programs of physical education.

Lastly, whether or not the term perceptual-motor persists, such programs will have left their mark in calling attention to the importance of planned programs of movement experiences emphasizing prerequisite skills and generalized movement patterns.

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Reaction to

RESEARCH FINDINGS REGARDING PERCEPTUAL-MOTOR DEVELOPMENT AND ACADEMIC PERFORMANCE

by

Walter Cooper
University of Southern Mississippi

It was interesting for Klesius to support the need for "bridging the gap" between the researcher and the practitioner. Many young researchers seem to recognize this need and seem to be forming specific ways of relating to the practitioner in the field.

Klesius actually developed his report around summary reviews of the literature in the areas relating perceptual-motor, or motor performance, to reading achievement.

A point which needs to be emphasized is recognition, as in Balow's research of findings, of the lack of support for motor training programs to improve reading achievement. It is interesting that Balow did identify positive reasons for including perceptual-motor activities in the curriculum of the young child. The six suggestions were related to affective components of functioning and possibly offer the suggestion of perceptual-motor activities as contributor to readiness for attacking academic tasks. This is certainly a hypothesis that needs to be further investigated.

Cratty's summary indicates right off the need for recognition of the generality-specificity principle; the fact that in perceptual-motor training programs the only performances improved may be those specific tasks engaged in. There may not be transfer to other skills. Also, a very important point raised by Cratty and brought out by Klesius was the fact of timeliness of intervention; more change will be brought about by attacking problems at the age when the development is proceeding at the most rapid rate (Bloom, Stability and Change in Human Characteristics, 1964). Gross motor development proceeds at the most rapid rate in children from birth to about 8 years of age.

Certainly the points brought out about screening out children with perceptual-motor problems and providing a special program, and also the fact that improved motor functioning may improve self-concept (or other affective variables) and not academic achievement directly, have merit. The idea of the active learning games (problem solving)

approach is particularly interesting as it relates so closely to the techniques employed in movement education.

The comments on Glass and Robbins' review of the Delacato methodology were quite interesting and back up the general lack of scientific evidence to support claims in this area. However, I feel strongly that we should be careful about condemning approaches dealing with severely handicapped children. These programs usually must deal with individual cases and scientific evidence based on sound research methodology is many times an impossibility. Thus, case study work by highly trained specialists in the particular program may be the most reliable evidence available.

At this point in my reactions, I feel I should emphasize my orientation to utilizing research findings in the decision making process. Research generally does not prove very much, but it should provide evidence to aid the practitioner in making decisions relevant to program change and curriculum development.

It does not seem so strange that Klesius, in his 1970 review, found 12 studies supporting perceptual-motor programs and 16 studies rejecting a significant difference in favor of such programs. As in many areas of research in the motor domain, there is a vital need for a model of some sort to serve as a guide for the development of research studies. Possibly there might be within a few years a number of studies based on the same model. This then would allow some generalization as to the value of perceptual-motor programs. Much of the research in this area, at the present time, must be referred to as isolated studies which do not add up to much when compared, because of numerous different variables (age level, sex, I.Q. levels, tests employed, length of training programs, etc.) utilized.

Klesius' criteria for "quality" research were particularly interesting. I agree that many programs in existence in the past have been too narrow in scope. This calls for or almost demands that a multidisciplinary team be formulated, if learning problems are really to be attacked scientifically and the numerous possibilities for interacting variables explored.

Concluding Remarks:

It was evident that much attention needs to be paid to the specificity-generality principle in trying to make sense out of the

theory and research evidence in the perceptual-motor area. There appears to be many separate perceptual and motor variables interacting in the developmental process. The exact role of these variables is unclear at this time. The practitioner needs some set of suggested guidelines pertaining to screening, testing, and program development. This set of guidelines could possibly be formulated with the help of representatives from several professional organizations. A multidisciplinary attack certainly seems warranted and feasible as a point of focus from the experience of the Perceptual-Motor Task Force sponsored conferences.

PERCEPTUAL-MOTOR DEVELOPMENT AND LEARNING READINESS SKILLS

by
Lee W. Haslinger, Ed.D.
Director of Physical Education, Athletics and Recreation
School District of the City of Pontiac, Michigan

Within the past ten years, there has been increasing excitement in the clinical and educational fields as the motor behavior of children came into sudden prominence as a significant component in the learning situation. We should recognize that this present awareness and concern for motor efficiency is derived from a rich background of education and experimental literature. Montessori, Itard, Sequin, Piaget and others each in some manner has emphasized the significance of motor and sensory efficiency in learning.

I believe that one of the reasons for this increasing excitement was the publication in 1960 of "The Slow Learner in the Classroom," by Newell C. Kephart, designed to assist the teacher in increasing the academic achievement of those children who find a large number of school tasks impossible. Also, the publication, again in 1960, "Success Through Play," by Radler and Kephart was written basically for parents to help their pre-school child prepare for school and the years ahead. Shortly thereafter, in 1962, G. N. Getman, O.D., authored his book "How to Develop Your Child's Intelligence," which was directed to all parents of all children in the pre-school and primary grade age group.

Somehow, in our sincere enthusiasm, physical educators began to develop "perceptual-motor programs" designed primarily to increase the level of academic achievement, particularly reading. Some adopted the "knee pad" approach to teaching all children to read better and to "maximize their intellectual potential." Others developed perceptual-motor programs which were more comprehensive and included a variety of tasks emphasizing balance, body-image training, agility, and hand-eye coordination activities. Curiously enough, some of these programs worked -- some didn't.

But what these early efforts of physical educators did do was to raise a lot of questions -- about the role of the physical education teacher on the educational team -- about their own knowledge of movement and learning -- the significance of early motor learnings -- about how children learn and the process of developing intelligence -- about the intellectual demands of motor tasks -- about sensory input -- about children who were awkward, clumsy, coordinated -- about curriculum -- the meaning and purpose of play -- the emotions and feeling of the learner and about the process and product of motor learning. I submit that the first important step towards reaching meaningful and productive solutions is the raising of thought provoking and stimulating questions.

The decade of the sixties focused on the learner, the role of perception in learning, and the learner with special needs including the learning disabled child. The sixties also saw a shift of emphasis to the early years in child development and thus the timeliness of the topic "Perceptual-Motor Development and Learning Readiness Skills." In the decade of the seventies, I believe the focus will shift to the teacher as teaching methods and materials are tested and tried to accommodate that which we think we know about how children learn. Dr. Sylvia Richardson suggests that much of what educators now label as "learning disability" or "minimal brain dysfunction" has a pedagogical, not a medical basis. It is a teaching rather than a learning disability and reflects a method of instruction that is unsuitable for a child rather than his inability to learn for organic reasons. We will begin to implement that which we think represents answers to the pressing question of "why children fail in school" -- a question that has nagged far too many parents and far too few teachers and administrators of years. Hopefully, too, in the seventies schools will judge the success of their efforts not only at the end of the 12 years on the basis of students being prepared for the world of work or for post-graduate education, but also

at the beginning of the 12 years on the basis of guaranteeing each student a firm foundation of learning readiness skills for meaningful and productive educational experiences yet to come.

A TIME FOR CHANGE

It is time in education to re-evaluate some of the information upon which we base school organization and teaching practices. Times of austere budgets can be a blessing in disguise if we attempt to take a critical view of present ways of doing things and attempt to re-group and re-organize our resources based upon the best information currently available about how children learn and how teachers teach and the role of parents in the teaching and learning process.

For example, we have the right to seriously question the assumptions that:

1. children have acquired pre-requisite learning skills by age 5 or 6 when they enter school;
2. teachers and parents need not be concerned about what has or has not happened to children before they come to school;
3. intelligence is fixed and unchanging;
4. classroom teachers should be concerned only with perceptual development and physical education teachers should be concerned only with motor development;
5. all children need the same "dose" for everything for similar periods of time;
6. some children need a "Head Start but not a Body Start;"
7. the fourth grade is soon enough to identify learning disabled children.

DEVELOPMENTAL LEVELS OF LEARNING

This transparency summarizes some stages in the developmental levels of learning as children move through from birth to age 7 or 8 or to this stage of cognition and

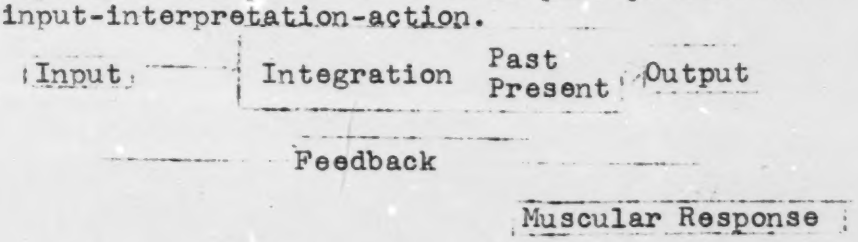
abstract thinking. You should recognize that this is an oversimplification of the complexity of child growth and development and does not adequately depict the interweaving and concomitant factors of social, emotional, and physical growth. Nor does it showthe input modes or output systems and the feedback mechanisms in the total integrative system of each human organism. However, it does demonstrate the sequence of proprioception, perception, conceptual and cognitive systems of learning. (Appendix A)

This chart does show that the first learnings of the child are motor learnings. Man first learns to move and then moves to learn. It also shows that the greatest amount of perceptual-motor change occurs in children before the age of seven. It should tell us, too, that perceptual-motor deficits should be identified as early as possible in the life of a child for there is no second chance at childhood.

DEFINITION OF TERMS

If we are to discuss perceptual-motor development and learning readiness skills, it is important that you are aware of the definition of the terms as I will use them.

Perceptual-Motor - This term connotes a relationship between perception and movement. They are unseparable and thus the hyphen. Except for reflex action, all movement involves perception. The two words represent two parts of a three part process of input-interpretation-action.



Perceptual-Motor Activities - Perceptual-motor activities are those activities which emphasize response where interpretation of sensory stimuli is necessary. (For example, do a seat drop on the trampoline when you hear two soft beats of the drum or move across the floor in no more than six steps.)

Perceptual-Motor Abilities - Perceptual-motor abilities represent the desirable outcomes or objectives of perceptual-motor activities and include such attributes of movement as:

Balance and Posture
Locomotor Skills
Body Identification
Spatial Awareness and Position of Body in Space
Laterality
Directionality
Form Perception
Figure Ground
Hand-Eye Coordination

Perceptual-Motor Development - This phrase is defined as utilizing perceptual-motor activities to improve perceptual functioning and promote efficient movement.

Learning Readiness Skills - Learning Readiness Skills or abilities are those attributes which enable a child to successfully manage and complete tasks encountered in school. (Appendix B)

I believe that perceptual-motor abilities are important to promoting movement efficiency. I also believe that perceptual-motor abilities are pre-requisite learning readiness skills. However, we must also accept that a child's readiness to learn involves his sense of security, his self-concept, his or her parents' aspirations and expectations, priority for language development in the home, visual efficiency, speech and hearing, auditory discrimination skills and the nature and amount of assistance provided at home to facilitate learning in a variety of situations and other attributes and characteristics.

ARE PERCEPTUAL-MOTOR PROGRAMS PHYSICAL EDUCATION?

The confusion over whether or not perceptual-motor programs are physical education is natural but unfortunate. Most, if not all, activities already included in elementary physical education programs are "perceptual-motor" activities. But that's not all they are. Many of these same activities are also "fitness" activities or "creative" movement activities. Teachers teach children through physical

education and they select the instructional tools to accomplish specific objectives at specific points in time for specific reasons. The tools include a variety of teaching strategies, activities, environments, and equipment and supply items. What makes a "jumping jack" a warm-up activity; a "fitness" activity, or a "perceptual-motor" activity depends entirely upon the objectives the teacher has in mind for that task to serve.

PERCEPTUAL-MOTOR DEVELOPMENT AND ACADEMIC ACHIEVEMENT

Physical education does not have to prove that it contributes directly and precisely to improving academic achievement of children to be recognized as a valuable asset to the educational program, particularly in the elementary school.

Major contributions of physical education as summarized from research with mostly normal children include:

1. Exercise stimulates growth of body and makes the individual stronger and more capable of efficient function.

2. Health, strength and physique determines to a great extent, what, and especially how well, a child plays. Play skills, in turn, are of major importance in companionship and friendship in the social relationship of children. How a child moves is a primary way in which he is judged by his peers.

3. Mentally healthy people participate in some form of volitional activity to supplement their required daily work. Participation in such leisure time activities almost always requires instruction and practice.

The question remaining is whether or not perceptual-motor abilities are important both in predicting and improving academic achievement and in promoting the development of essential learning readiness skills.

Scubic and Anderson, writing in the Journal of Learning Disabilities state that "as yet, there is little factual evidence available which indicates the precise relationship of perceptual-motor ability to conceptual ability and to intelligence...."

Ismail reminds us that "...all of the supportive findings pertaining to motor and intellectual development are based upon correlation techniques only. Such findings should not be interpreted in terms of cause and effect."

These following developmental symptoms of learning disabilities illustrate that poor coordination is often identified with the learning disability child, but one should be hesitant to claim that it is a direct cause.

Easily distracted
Cannot seem to control self
Confused in following directions
Hyperactive and restless
Often withdraws quickly from group activities
Explosive and unpredictable behavior
Upset by changes in routine
Reading is poor -- general underachiever
Immature speech and poor language development
Poor coordination

In one study, correlation between achievement and perceptual-motor ability was reported as high but not a perfect one. Therefore, teachers and parents can expect to find low achievers who have little or no difficulty performing motor activities and they can find some high achievers who will not perform as well.

Steve Klesius reviewed the research available which proposed to determine the effectiveness of programs of perceptual-motor development upon reading readiness or reading achievement of intellectually able children. He concludes that "the hypothesis that perceptual-motor development programs positively influence reading achievement can neither be confirmed nor denied on the basis of the research review." (Parenthetically, neither can the question of the effectiveness of smaller class sizes be confirmed or denied on the basis of research available.)

Klesius concludes, however that:

> "Individualized perceptual-motor programs are developmentally appropriate for disadvantaged children as a preventive program or for some children with learning disabilities as a remedial program -- the best advice for the teacher responsible for facilitating

> opportunities for a person to exercise his right to read is to consider perceptual-motor programs as having value in being a supplement, not a substitute, to individualized competency and reading instruction.

I subscribe to this conclusion and to Klesius' implication that the inclusion of perceptual-motor activities in replacement for free play and game oriented physical education in day care, early childhood education or primary grade school programs is desirable.

PROMISING DIRECTIONS IN PROGRAMMING

I alluded earlier to the fact that perhaps physical educators listened more to Kephart in the early 60's than they did to Getman resulting in a sort of pre-occupation with dysfunction leading to assumptions that perceptual-motor activities were only for those with specific deficits. Our first effort in research in Pontiac in 1965 is a perfect example. The study was entitled, "The Effects of Perceptual-Motor Training on Perceptual and Reading Ability." Curiously enough, the analysis of data indicated that perceptual-motor activities added to the regular physical education program for children with reading problems contributed significantly to the improvement of perceptual and reading ability.

Interest and concern on the part of the physical educators across the nation spurred the AAHPER to appoint the Perceptual-Motor Task Force in 1967. The Task Force set about to plan experiences to enable physical educators to interest with those from the educational and medical professions and explore the multi-disciplinary dimension of perceptual-motor development and programs. From the First Symposium in 1968 to the National Conference "Perceptual-Motor Development -- Action with Interaction" in 1970, to the Region West Perceptual-Motor Conference in August to this Conference today, I think we can now begin to see more clearly the role of the physical educator in perceptual-motor development programs, quality pre-school and preventive early elementary physical education programs and therapeutic or remedial educational programs.

I will describe some of the ways in which physical educators can get involved in perceptual-motor programs designed to promote learning readiness skills. The programs will not strike you as unusual or unique. But they will serve as illustrations of efforts which, I believe, characterize directions of the future for all physical educators.

PRE-SCHOOL PROGRAMS

1. Experimental Programs

The Director and volunteer physical education teachers conducted two pilot pre-kindergarten perceptual-motor development programs. One was conducted during a regularly scheduled "Head Start" class. The other was conducted for a predominantly middle class group of children on an after-school basis. The objectives of these two programs were similar:

a. to determine the general gross motor characteristics and abilities of pre-kindergarten boys and girls;

b. to determine the general visual-motor characteristics and abilities of pre-kindergarten boys and girls;

c. to provide opportunities for enjoyable participation in a wide variety of physical education activities;

d. to assist in the development of a prototype of a more effective pre-kindergarten, kindergarten and primary physical education program which emphasizes the development of learning readiness skills and which promotes cooperative efforts on the part of physical education teachers, classroom teachers, parents and others concerned about the maximum development of each child.

Our theory was that you can't learn about the needs of pre-kindergarten children and effective teaching strategies, equipment and supplies by reading books. You have to get

in the gym with children, try out ideas, screening instruments, and new activities; prepare for parent information sessions and appraise parents of the program and needs of their children.

2. Human Resource Center

An innovative educational facility and educational program in Pontiac will provide for the assignment of teachers to work half days with kindergarten children and half days with kindergarten children and with their parents. The pre-school children will be taught in groups in the community using volunteer assistance with some instruction provided in the classroom setting in the Human Resource Center. The program for three and four year old children will place a strong emphasis on parent education directed towards assisting adults in developing learning readiness in children.

The implication for physical education is obvious. Ray Barsch said some years ago that the strategy of the schools must be plotted along three levels. The first was the developmental level which requires that knowledge of movement must be communicated to parents as a preventive measure against learning failures.

EARLY ELEMENTARY PHYSICAL EDUCATION PROGRAMMING

Like "fitness" activities, "sports skill" activities, "creative movement" activities, etc., "perceptual-motor" activities represent teaching tools and objective areas to be utilized by the wise teacher to achieve stated objectives of physical education by organizing a physical education program which contributes to the concept of integrated development for each individual child.

Our early experience with perceptual-motor development programs led us to accept that essential attributes of efficient movement coincided with essential learning readiness skills. Consequently, we have organized our

elementary physical education program so that perceptual-motor attributes become the major objective areas into which we organize our activities. This is not to say that we ignore the objective areas of physical fitness motor skills, creative movement and social development. We just felt this was a better way of organizing learning experiences in grades K-1-2 compared with low organization activities, athletic skills, rhythmic activities, etc. This chart indicates the total program of activities for grades 1-6. We also provide weekly objectives with appropriate activities geared to perceptual-motor abilities for grades K-1. (Appendix C)

Our experience in Pontiac in attempting to improve our elementary physical education program by better understanding perceptual-motor development has benefited both teacher and pupils in several important ways.

Some classroom teachers and physical education teachers began to speak the same language and discovered that they shared common concerns about children. Some physical education teachers began to take a new view of children. They became increasingly concerned with both "how" and "why" children were performing or not performing and this is an important step towards meaningful teaching. Armed with more recently recognized components or attributes of movement they were able to differentiate between efficient movers and inefficient movers with terms more descriptive and more diagnostic than "coordinated" on one end of the spectrum and "awkward and clumsy" at the other end.

Some physical education teachers know now that all children can perform basic movement patterns and experience success for they recognize that there is no "one" right way. The message of Muska Mosston-- teach for inclusion, not exclusion -- has a deeper meaning. These teachers found many more children who were more active, happier, and who developed better feelings about themselves and their ability to move through space when a child centered

experiential program was developed. Finally an inter-disciplinary approach to children with learning disabilities began to take place. The physical educator became a working partner with principals, classroom teachers, parents, psychologists, and reading teachers in assisting to diagnose abilities and disabilities and prescribe educational programs.

As a partner, the physical education teacher profited by a fuller appreciation of the many factors which may be limiting a child's performance.

The emphasis on perceptual-motor development in grades K-1 serves another important purpose -- that of screening, assessment or diagnosis. Kindergarten should be the screening year. The wise teachers of physical education know that he or she must assess the abilities and disabilities of children in order to establish a starting point for developing appropriate activities and determining their sequence and duration based upon identified needs of children. Teachers are encouraged to observe children in play, in activities planned in the gymnasium and note behavior or performance which might appear deviant in terms of developmental expectations. They do this by observation or by utilizing a simple screening checklist. The article by Bob McAdams in the Proceedings of the National Perceptual-Motor Conference -- "Foundations and Practices in Perceptual-Motor Learning -- A Quest for Understanding," summarizes other selected perceptual-motor assessment tools. Sheldon Rappaport emphasizes that teachers must learn to read the information each child gives them daily. Madeline Hunter believes that diagnosis need not be a time consuming, elaborate process, and I agree at this stage. What should the child do to learn it is the critical diagnostic question.

Limitations of time and staff prevent us in Pontiac to take the next crucial steps in the assessment sequence, except in a few instances. I believe we need to develop

a screening instrument which is more definitive than observation by the teacher or a simple checklist. We need an instrument that tells us more about a child, how he moves, how he reacts to sensory input and about his abilities and disabilities in a variety of gross and fine motor tasks.

This information, then, must be packaged in a form that is helpful to the teacher. In our experience we have used a vareity of self-made assessment tools combining test items from instruments developed by Cratty, Kephart, Vanguard School, Rosner and others. We have used the Purdue Perceptual-Motor Survey and are now experiementing with the Evanston Early Identification Scale, the Anton Brenner Developmental Gestalt Test of School Readiness, the Development Test of Visual-Motor Integration and some of the Winter Haven materials. We hope soon to get some experience with tests by A. Jean Ayres involving space tests, kinesthesia and tactile perception tests, motor accuracy tests, perceptual-motor tests, and figure-ground visual perception tests.

Information obtained about the child is more useful when it is assembled with information gathered by the counselor, the classroom teachers and the parents if there is suspicion that the child may have a learning disability. The physical educator can determine that a child is an inefficient mover and begin a remedial program. He should not independently diagnose the child as a learning disability or potential learning disability child without the assistance and confirmation of the educational team.

Meaningful educational intervention or remedial programs must follow the identification and diagnostic process. We know that it takes many hours of concentrated practice and expert instruction with the motivated, skilled mover to develop quality performance. We have provided such opportunities plentifully in today's schools.

Attention must now be given to maximizing the potential of those identified as inefficient movers and this means

after-school and summer programs and perhaps increased time during the regular school day if such difficulties are interfering with the learning process.

In the past, efforts to provide additional physical education time for inefficient movers and children with inadequate learning readiness skills have taken the form of:

1. Saturday morning swim-gym program
2. Summer-weekly swim-gym
3. Operation "Body Start" -- summer daily gym program
4. In-school scheduled time for children with special needs

Objectives for each of these programs have included at least some of the following:

1. Provide an enjoyable physical education and play experience for children;
2. Experiment with teaching methods and equipment and supply items;
3. Provide activities geared to the special needs of children;
4. Provide exposure to remedial or therapeutic activities over a concentrated period of time;
5. Attempt to discover appropriate sequences and duration of perceptual-motor activities;
6. Integrate typically classroom learning readiness experiences with typically physical education experiences.

With respect to #6 above, I see a trend towards utilizing enjoyable physical education activities to teach essential learning skills such as word recognition, sequencing, visual memory, self-concept, vocabulary, number concepts, etc. The emphasis will be on the interpretation of sensory output and making appropriate responses with the attention focused on the understanding of the task rather than upon the quality of the response itself. In other words, physical education activities will become the medium of instruction but the objective will be a variety of learning readiness skills and/or academic skills.

Finally, the concept of programming and facility development at the Human Resource Center in Pontiac illustrates a new trend, at least as far as our discussion today. We have already looked at the pre-school and kindergarten programs to some extent. Children in grades 1, 2, and 3 will be screened through the third grade for perceptual-motor deficiencies; for signs of inefficient muscle use; postural faults; physical immaturity; underweight and overweight; and low levels of physical fitness. A specialist in motor learning will work with small groups of children with similar problems to correct deficiencies, provide compensatory activities and prescribe follow-up activities. This specialist would begin to develop diagnostic information based upon early contact in kindergarten and first grade. An increasing amount of his time would be spent gathering diagnostic information and identifying areas where help is needed. The specialist would serve with others, including teachers and other specialists, to diagnose and prescribe psycho-educational programs of a developmental or remediation nature.

Children free of handicapping defects will participate in regular programs of physical education designed to continue to promote the development of basic motor skills. Activities will be selected to develop in children a high level of cardio-vascular fitness and muscular strength along with skills of throwing, catching, kicking, batting, dodging, skipping and balance. Games and activities will be selected which require children to combine various skills in the performance of lead-ups to more traditional sports and recreational activities which are to follow in the upper elementary.

Madeline Hunter, speaking at the National Multi-disciplinary Conference on Perceptual-Motor Development in Cincinnati last fall, provides us with this appropriate conclusion when she said:

"Our new focus on and alertness to perceptual-motor

dimensions afford new insights into the learning process, and movement experiences which improve the perceptual-motor capacities shall play in increasingly important role in education."

APPENDIX A

STAGES OF PERCEPTUAL-MOTOR DEVELOPMENT NORMAL CHILD

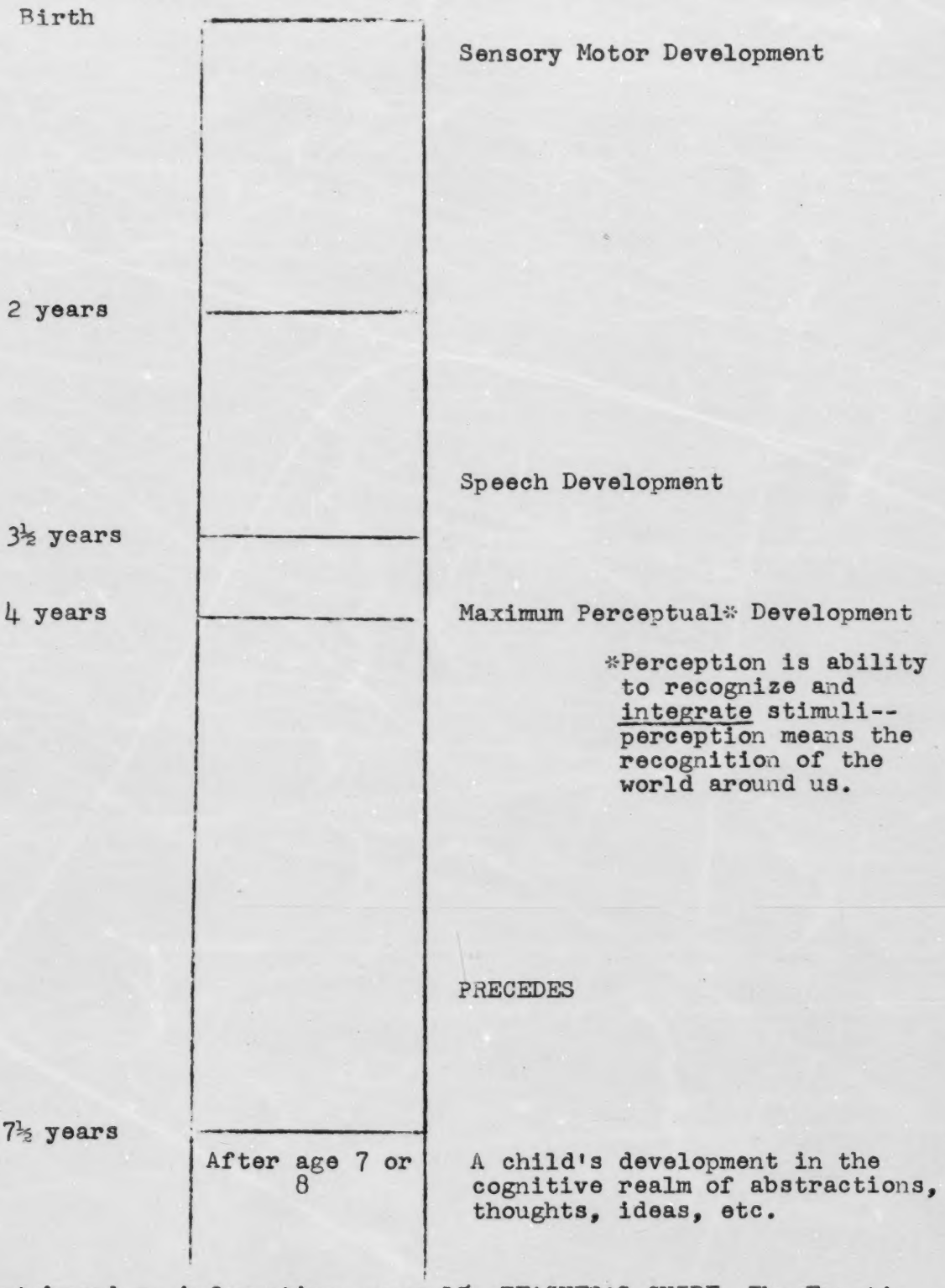

Birth
Sensory Motor Development
2 years
Speech Development
3½ years
4 years
Maximum Perceptual* Development
*Perception is ability to recognize and integrate stimuli--perception means the recognition of the world around us.
PRECEDES
7½ years
After age 7 or 8
A child's development in the cognitive realm of abstractions, thoughts, ideas, etc.

Chart based on information, page 15, TEACHER'S GUIDE, The Frostig Program for the Development of Visual Perception.

APPENDIX B

LEARNING READINESS SKILLS
The School Readiness Checklist

A check list for parents to help in appraising readiness for school

(Sample items related to neuromuscular development)

1. Stand on one foot for 5 to 10 seconds.
2. Alternate feet walking downstairs.
3. Tell left hand from the right.
4. Remember instructions and carry out 2 or 3 sample tasks after being told once.
5. Count 4 objects.
6. Draw or copy a square.
7. Know how many feet he has.

Evanston Early Identification Scale

1. Draw "someone" -- points assigned for items included and placement.
2. Indicates a degree of risk of having visual or visual-motor handicap.

Katrina de Hirsch

1. Maturational level of child's human figure drawing and his school achievement are significantly related.
2. Ability to recognize and to reproduce various forms and shapes is helpful in predicting reading achievement.
3. A child's mastery of printed words depends on his comprehension of these words when he hears them in conversation. (Primers are action oriented -- Run, John, Run).
4. The ability to name letters at the beginning of first grade is highly predictive of reading achievement at the end of the year -- (trampoline activities) -- letter of the day -- word of the day -- (body alphabet).
5. Matching sequences of objects, shapes, and letters is positively related to reading achievement. (Activities utilizing visual achievement templates -- hula hoop lesson plan).
6. Ego, strength, and ability to invest energy in a goal-directed way correlates positively with school achievement.

Before We Read
Scott, Foresman and Co.

1. Visual discriminations and left to right progression.
2. Comparing size and shape of objects.
3. Sense and describe emotional reactions -- (posture, gait, etc., -- sad -- happy).
4. Perceive relative size and sense distance in a picture.

Before We Read

Continued:

5. Noting differences in position, internal detail and shape and in detecting missing parts.
6. Perceive place (spatial) relations.
7. Noting similarities and differences.

Developmental Test of Visual-Motor Integration
Keith Berry

"Before a child can understand and express information with letter and number symbols, he must learn to use his senses and his body in an efficient manner -- Our experience in helping children with learning disabilities indicates that the largest number of difficulties are of an integrative nature, and that one of the most common integration problems involves the coordination of visual and motor functions."

School District of the City of Pontiac APPENDIX C

DEPARTMENT OF PHYSICAL EDUCATION, ATHLETICS AND RECREATION

First Semester - Elementary Physical Education Activities

1971-72

Dates	1 - 2	3 - 4	4	5	6	Special
Sept. 20-23						Track and Fi Day
Sept.27-Oct. 1	Perceptual-Motor Screening 3 weeks		Softball Skills 4 weeks	Soccer Skills and Physical Fitness Tests 4 weeks		Cummulative scores for grade and
Oct. 4-8	Include Kdg.					City-Wide Fitness Awar
Oct. 11-15						
Oct. 18-22	Perceptual-Motor Skills		Basketball Skills →			Grades 4-5-6 Basketball T
Oct. 25-29	Weekly Obj. Tires Hoop Balance Beam		3 weeks			Saturday
Nov. 1-5	Hopscotch Parachute					Grades 1-2-3 Fall Fitness each school
Nov. 8-12	Ball Activities Mat Work					
Nov. 15-19	Trampoline Jump Ropes Rhythms		Floor Hockey Skills →			Saturday Floor Hockey Tourney
Nov.22-23-24				Gymnastics		Flipper Club Monkey Club
Nov.29-Dec. 3		Tumbling Skills Mini-Tramp Strip Tumbling Partner Stunts Pyramid Stunts		Low and High Parallel Bars Side Horse Balance Beam Floor Exercise Ropes Trampoline		School Gymnas Meet
Dec. 6-10						
Dec. 13-17						Saturday Gymnastic Center
Jan. 3-7						
Jan. 10-14						
Jan. 17-21		Wrestling and Volleyball				School Wrestl Tourney
Jan. 24-28						
Jan. 31-Feb. 3						Saturday City-Wide Tourney

CONFERENCE SUMMARY AND IMPLICATIONS FOR EDUCATION

by

Dr. Katurah Whitehurst
Department of Psychology
Virginia State College
Petersburg, Virginia

I have been asked to summarize this conference, and to give some implications as I see them, for education. My own impression is that this has been a wonderful conference. The program planners are to be commended for their selection of scholars who have brought to us not only the facts of their research but also their interpretations and insight that have been illuminating for us all.

The panel which started the ball rolling provided us with clear expositions of the interdisciplinary bases of perceptual-motor development. Dr. Cohen, using diagrams and explanations, described the neurophysiological relationship of perception and motor activity as being inseparable: inseparable functions thought specific in nature. Perception cannot be achieved, said he, without authorization of motor activities. Those text books that treat conscious awareness and motor behavior separately are overlooking the neuroanatomical fact of their unity. Environmental stimulation in the form of complex perceptual input is prerequisite to intellectual functioning. Any physical activity requiring complex sensory input, sensory discrimination and motor response can influence brain development as a whole including intellectual development. If we were in doubt concerning the neurophysiological underpinnings of the perceptual-motor relationship, Dr. Cohen's discussion has given increased confidence.

Dr. Harriet Williams discussed information processing and perceptual-motor development. She emphasized certain developmental trends among which were: 1) the shift from the dominance of the touch receptors to the distance receptors, particularly the visual; 2) increased intrasensory communication in which there is a more and more effective use of a variety of cues from different sense modalities; (in other words, a trend from unimodal to multimodal functioning) 3) increase in intrasensory efficiency marked by the child's ability to make increasingly clear cut responses, to see more details, to be more precise as shown by a refinement of sensory input in one modality. Slowly developing and normally developing children were found to differ in their levels of intrasensory

development. The normals being multimodal, while the slow are unimodal, such as vision bound in their responses.

Some of the persistent questions of orientation in interdisciplinary proposals were of course asked. For example: Where does my profession stand? Is perceptual-motor development an addition to physical education, a part of a good physical education program, or the essence of a good physical education program. In other words, I sense that what was being asked is where do I stand, where am I? The participants sought answers to other questions such as how early should we start? does motor development really facilitate mental development? and what can I do to remediate? These are the perennial questions at conferences such as these.

The movement education demonstration, though not a lesson, did provide Dr. Tanner and Mrs. Young with concrete examples to show ways in which children respond in individual ways to open-ended tasks. It appeared to be a way of individualizing instruction without devising individual tasks. Despite the appearance of each child's doing his own thing, when open-ended tasks are set, the children work for quality achievement at their own developmental level.

Dr. Marguerite Clifton described and discussed a program of perceptual-motor development activities in the pre-school and primary grades. I was particularly impressed by the attitude of flexibility that accompanied the careful analysis of tasks. In Dr. Clifton's words, "Each semester's feedback leads to changes. Performance expectancies for 2-5 year olds were still unknown but we expect that norms are forthcoming soon." Although Dr. Clifton was generously commended for the design and execution of her program, she maintained a healthy scientific reserve regarding claims of casual relationships.

On Friday I found myself in the dilemma of being unable to be three persons. I had to choose two out of three discussions. Dr. Elmer Kane spoke on perceptual-motor development programs for children with learning disabilities. After differentiating between the concepts of deficit and disability, Dr. Kane further specified the areas in which physical education could make its contribution. These areas were: tactile development, kinesthetic development, and visual perception. Learning depends on movement; physical education sets a seed bed for learning. Many school requirements depend on prior

learnings gained through movement. Children are required to sit still and listen in school, but children who do not move well cannot sit still. We want children to be oriented in space and time. Directionality is learned. In eye movements, two unrelated eyes must work together. Physical education can help here. Reminded of the statement of a Russian scholar, that all learning is motorically based; and also reminded of Hebb's work on stimulation, Dr. Kane would hazard a new definition of intelligence as: the efficiency of the human body.

Those persons who are inclined not to consider play as a serious business should have heard Dr. Mary Moffit discuss play as a medium for learning. According to her, children created play and have similar patterns of play all over the world. We need to know more about the real nature of play. Play provides information, uses different sensory modes, provides self-knowledge, and provides for cooperation and creativity. The importance of play is not always evident to parents who must be shown that there are important learnings in addition to or other than the academic learnings. Using the theories of Piaget and Bruner, Dr. Moffit outlined important stages in cognitive development. In order to learn subject matter a child needs experiences in spacial orientation, body awareness, manipulating objects, ocular patterns, hand-eye coordination, and locomotor patterns. Four hundred pairs of muscles need vigorous play; the regrettable fact is that there are not many safe places left for play in the cramped conditions of inner-city life.

At the evening general session with Dr. J. McVicker Hunt, we found indeed that he was among those who make things happen. He reviewed for us some of the history of intelligence testing and pointed out modifications in assessment techniques by researchers like Glasser and Gené, who emphasize the development fostering circumstances as the independent variable in intellectual growth. Our attention was called to the unwarranted separation of learning and maturation, and the present high interest in enlisting the help of mothers in motivating development, which in part is due to Dr. Hunt's work.

Implications for Future Action - Throughout this conference certain words continued to recur: interdisciplinary, synthesis, interaction, integration, intrasensory, and inter-relations. We want to know the nature of these relationships, how they occur, where they

occur, and under what circumstances. The emphasis upon increasing complexities of reception, of processing, and of reacting demands a pooling of knowledge from many sources, not just in an additive fashion but in a creative way. We are no longer satisfied with partial information. We want to see wholes. To achieve wholeness in our understanding there must be in fact teamwork. It is time now to move away from the convention rhetoric on the bright promises of interdisciplinary study, to its actual practice on our campuses and in our schools. Models of interdisciplinary practice should be developed in strategic places throughout the country; research models and teaching models with continuous feedback between the two should be designed. We should establish and articulate reasonable and specific objectives, develop a few testable hypotheses, test them systematically in selected areas, and use the observations and findings as feedback for verification of the original hypotheses. The goal being to evolve, even to hammer out a few generalizations, principles, statements about moving and learning relationships that will hold water and that can be repeatedly demonstrated in a variety of situations. Discussions at this conference have reassured me that we have developed adequate leadership for this next step. This is the first implication for education derived from our experiences in this conference.

Next, deprivation studies have led to a new emphasis upon the significance of the early years. This implies that education must make an early start for already, even before nursery school, significant learnings have taken place. At worst they have not taken place, hence perceptual-motor development programs rightfully address themselves to earlier and earlier years. Bruner, in his article titled "The Cognitive Consequences of Early Sensory Deprivation" suggested that, early sensory deprivation prevents the formation of adequate models and strategies for dealing with the environment. Thus, if we expect to develop adequate techniques for coping with environmental or learning demands, we must start early in providing the kind of perceptual-motor stimulation that will lay the foundation for efficient adaptive modes. One of the outcomes of computer technology has been an added emphasis upon cognitive functioning. The rediscovery of Piaget has not been solely responsible for this emphasis. Cybernetic models have forced a re-examination of our learning

theories. The passive reception of impressions has been displaced by a focus on process and activity, including selectivity, discrimination, comparison, and decision. Learning is an active process; learning is a highly complex process. This implies that simplistic learning theories are inadequate for explaining the learning process. Here again we look forward to a significant refinement of learning theory by the interdisciplinary team. For example: do we know enough about transfer of training? Does our present knowledge of transfer adequately support the claim that efficient body management leads to positive self-concepts which in turn lead to more efficient learning of reading skills? Is it not commonly found that a child may manage his body well, yet may not think that he does, or he may not value this fact, and still considers himself as incapable. Where then is the relationship? Is it between efficient body movement and reading, or between the self-concept and reading? My hypothesis would be that these specific relationships are of no consequence, but the significance lies in the concept of the total person being adequately efficient. Today we are witnessing a resurgence of humanism as a reaction to competitive and technological demands. More than once at this conference, we have heard the call for a moratorium on testing, as we have done it, with its built in capacity for fostering competitiveness in education. Instead a modification in assessment techniques has been suggested which emphasizes performance as a function of development fostering circumstances. I submit that this is a humanistic orientation.

If the full development of the total person becomes the true aim of education, then the implication for education is clear. There must be a new arrangement of our teacher education programs. Just as we tend to repeat our mother's patterns of child rearing, we also repeat our teacher's pattern of teaching. For the most part, this is done unconsciously, but now we must consciously create a new teaching pattern based upon our philosophy of interdisciplinary efforts toward developing all aspects of the child's potential: perceptual-motor, affective, and ideational. Future teachers will then repeat the pattern as they have come to know it.

These then are four implications for education. I repeat (1) with the present level of interdisciplinary sophistication in research and curriculum planning, we may well enter upon a phase of demonstration (2) we cannot start too early to prevent sensory

deprivation, hence programs of parent education must parallel programs of teacher education (3) a re-examination of learning theory is in order, with special emphasis on the nature of transfer of training, and (4) a new plan of teacher education should include the prospective teacher as an apprentice on the interdisciplinary team. There is no doubt in my mind that the walls of disciplinary privacy are tumbling and that interdisciplinary understanding and cooperation are a necessity for understanding human development and learning. It is not enough to become more and more efficient in dealing with that fragment of the child about which our training makes us knowledgeable. More importantly, we must understand how our specialized knowledge dovetails with, supports, enlarges the insights of other disciplines, and how together we can build an educational schema for guiding the child to his fullest development. Thank you.

EXHIBITORS

These companies were represented at the Region East Perceptual-Motor Conference.

Educational Activities, Inc. Freeport, N. Y.	Al Harris
J. A. Preston Corporation New York City	Bill Young
Kimbo Educational P.O. Box 246 Deal, New Jersey	G. Carol Kimble
Trail Hop Games by Children Distributed by T.T.T. Eilts Wabash, Indiana	T. Eilts
Whittle Equipment Distributed by J.L. Hammett Co. Union, New Jersey	Joan Tillotson Geoffory Lansdale

TITLE OF FILMS SHOWN AT THE REGION EAST
PERCEPTUAL-MOTOR DEVELOPMENT CONFERENCE
and
NAME AND ADDRESS OF DISTRIBUTORS

Title: Looking at Children

Distributor: Metropolitan Life Insurance Co.
Health and Welfare Division
One Madison Ave.
New York, N.Y. 10010 (free)

Title: Early Recognition of Learning Disabilities

Distributor: U.S. Department of Health, Education, and Welfare
National Meidcal Audiovisual Center (Annex)
Atlanta, Georgia 30324 (free)

Titles: Thinking-Moving-Learning (Perceptual-Motor Program)

Anyone Can (Modified Physical Education Activities)

Everybody's a Winner (Modified P.E. Activities)

Distributor: Bradley Wright Films
309 North Duane Ave.
San Gabriel, California 91775 (Rental)

Title: Developmental Physical Education

Distributor: Simensen and Johnson
Educational Consulting Services
P.O. Box 34
College Park, Maryland 20740

Title: Play Therapy

Distributor: Dr. Viola Brody
Child Guidance Clinic of Pinellas Co.
908 S. Ft. Harrison Ave.
Clearwater, Fla.

CONFERENCE EVALUATION

The following patterns of representative statements emerged from responses made to open-ended conference evaluation questions by those participants who completed the post-conference evaluation form.

1. The opportunity to focus in depth for two and one half days on a defined area was appreciated by those attending.
2. The planned informal small group interdisciplinary discussion in the opening session was rated high.
3. The general informality of the conference and the eagerness of conference consultants and university persons to 'exchange' ideas with the teachers working directly with children was mentioned often.
4. The overall pace of the conference with spaced relaxation and/or recreation breaks met with the approval of the participants.
5. Many different presentations were selected as 'the best conference session' by participants and there was considerable variation in the stated reasons why the session was effective.
6. Statements such as: informal non-threatening atmosphere, small group interaction, realistic live demonstrations, clear audio-visual presentations, active participation in movement activities, combining theory with practice, were frequently mentioned as positive aspects of the conference.
7. The need was expressed for considerably more quality research in the area of perceptual-motor development.
8. There are so few of us here when there are so many more physical educators who could benefit from this experience- was alluded to quite often.

CONFERENCE COMMITTEE CHAIRMEN

The following individuals were instrumental in providing for the effective coordination and functioning of the conference.

Registration	Bob L. Beasley Professional Physical Education Department University of South Florida Tampa, Florida
Hosts and Hostesses	Herman Weinberg Professional Physical Education Department University of South Florida Tampa, Florida
Meeting Room Arrangements	William Price Hillsborough County School System Tampa, Florida
Audio-Visual	George Jones, Supervisor Elementary Physical Education Pinellas County School System St. Petersburg, Florida
Commercial Exhibits and Idea Mart	Charles Smith Professional Physical Education Department University of South Florida Tampa, Florida
Hospitality	Margaret Crickenberger Professional Physical Education Department University of South Florida Tampa, Florida
Conference News Coverage	Richard Heeschen Department of Physical Education University of South Florida Tampa, Florida
Conference Secretary	Jo Aaron Professional Physical Education Department University of South Florida Tampa, Florida